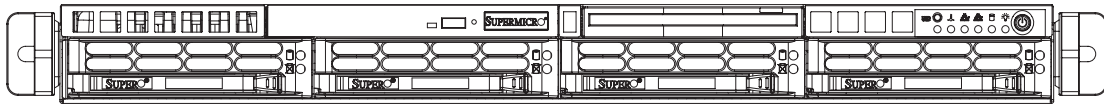


SUPERO[®]

SUPERSERVER 5015P-8(R)
SUPERSERVER 5015P-T(R)



USER'S MANUAL

1.0b

The information in this User's Manual has been carefully reviewed and is believed to be accurate. The vendor assumes no responsibility for any inaccuracies that may be contained in this document, makes no commitment to update or to keep current the information in this manual, or to notify any person or organization of the updates. **Please Note: For the most up-to-date version of this manual, please see our web site at www.supermicro.com.**

Super Micro Computer, Inc. ("Supermicro") reserves the right to make changes to the product described in this manual at any time and without notice. This product, including software, if any, and documentation may not, in whole or in part, be copied, photocopied, reproduced, translated or reduced to any medium or machine without prior written consent.

IN NO EVENT WILL SUPERMICRO BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, SPECULATIVE OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OR INABILITY TO USE THIS PRODUCT OR DOCUMENTATION, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN PARTICULAR, SUPERMICRO SHALL NOT HAVE LIABILITY FOR ANY HARDWARE, SOFTWARE, OR DATA STORED OR USED WITH THE PRODUCT, INCLUDING THE COSTS OF REPAIRING, REPLACING, INTEGRATING, INSTALLING OR RECOVERING SUCH HARDWARE, SOFTWARE, OR DATA.

Any disputes arising between manufacturer and customer shall be governed by the laws of Santa Clara County in the State of California, USA. The State of California, County of Santa Clara shall be the exclusive venue for the resolution of any such disputes. Super Micro's total liability for all claims will not exceed the price paid for the hardware product.

FCC Statement: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

Manual Revision 1.0b
Release Date: April 2, 2008

Unless you request and receive written permission from Super Micro Computer, Inc., you may not copy any part of this document.

Information in this document is subject to change without notice. Other products and companies referred to herein are trademarks or registered trademarks of their respective companies or mark holders.

Copyright © 2008 by Super Micro Computer, Inc.
All rights reserved.
Printed in the United States of America

Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 5015P-8(R)/5015P-T(R). Installation and maintenance should be performed by experienced technicians only.

The SuperServer 5015P-8(R)/5015P-T(R) is a high-end server based on the SC816S-400(R)/SC816T-400(R) 1U rackmount chassis and the Super PDSMP-8/PDSMP-i, a single processor serverboard that supports Intel® Pentium® D, Pentium 4 Extreme, Pentium 4 or Celeron® D processors.

Note: The "(R)" indicates a redundant power supply configuration.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the PDSMP-8/PDSMP-i serverboard and the SC816S-400(R)/SC816T-400(R) chassis, which comprise the SuperServer 5015P-8(R)/5015P-T(R).

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 5015P-8(R)/5015P-T(R) into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 5015P-8(R)/5015P-T(R).

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the PDSMP-8/PDSMP-i serverboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC816S-400(R)/SC816T-400(R) server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring Serial ATA or peripheral drives and when replacing system power supply modules and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS POST Messages

Appendix A: BIOS POST Codes

Appendix C: Software Installation

Appendix D: System Specifications

Notes

Table of Contents

Preface

About This Manual	iii
Manual Organization	iii

Chapter 1: Introduction

1-1 Overview	1-1
1-2 Serverboard Features	1-2
1-3 Server Chassis Features	1-3
1-4 Contacting Supermicro	1-6

Chapter 2: Server Installation

2-1 Overview	2-1
2-2 Unpacking the System	2-1
2-3 Preparing for Setup	2-1
Choosing a Setup Location	2-2
Rack Precautions	2-2
Server Precautions	2-2
Rack Mounting Considerations	2-3
2-4 Installing the System into a Rack	2-4
2-5 Checking the Serverboard Setup	2-8
2-6 Checking the Drive Bay Setup	2-10

Chapter 3: System Interface

3-1 Overview	3-1
3-2 Control Panel Buttons	3-1
UID	3-1
Power	3-1
3-3 Control Panel LEDs	3-2
UID	3-2
Overheat/Fan Fail	3-2
NIC2	3-2
NIC1	3-2
HDD	3-3
Power	3-3
3-4 SCSI/Serial ATA Drive Carrier LEDs	3-3

Chapter 4: System Safety

4-1	Electrical Safety Precautions	4-1
4-2	General Safety Precautions	4-2
4-3	ESD Precautions	4-3
4-4	Operating Precautions	4-4

Chapter 5: Advanced Serverboard Setup

5-1	Handling the Serverboard	5-1
5-2	Processor and Heatsink Installation	5-2
5-3	Connecting Cables	5-5
	Connecting Data Cables	5-5
	Connecting Power Cables	5-5
	Connecting the Control Panel	5-6
5-4	I/O Ports	5-6
5-5	Installing Memory	5-7
5-6	Adding PCI Cards	5-9
5-7	Serverboard Details	5-10
	PDSMP-8/PDSMP-i Layout	5-10
	PDSMP-8/PDSMP-i Quick Reference	5-11
5-8	Connector Definitions	5-12
	ATX Power Connector	5-12
	Processor Power Connector	5-12
	NMI Button	5-12
	Power LED	5-12
	HDD LED	5-13
	NIC1/NIC2 LEDs	5-13
	Overheat/Fan Fail LED	5-13
	Power Fail LED	5-13
	UID Button & UID LED	5-14
	Power Button	5-14
	JLAN1/2 (Ethernet Ports)	5-14
	Chassis Intrusion	5-14
	Universal Serial Bus (USB0/1)	5-15
	Universal Serial Bus Headers	5-15
	Fan Headers	5-15
	Power LED/Speaker	5-16
	Wake-On-Ring	5-16
	Wake-On-LAN	5-16
	SMB	5-17

	ATX PS/2 Keyboard and PS/2 Mouse Ports	5-17
	Serial Ports.....	5-17
5-9	Jumper Settings.....	5-18
	Explanation of Jumpers.....	5-18
	CMOS Clear	5-18
	JLAN Enable/Disable	5-18
	VGA Enable/Disable.....	5-19
	SMBus to PCI Slots	5-19
	SCSI Enable/Disable.....	5-19
	Watch Dog.....	5-19
	Compact Flash Master/Slave	5-20
	Power Force On	5-20
5-10	Onboard Indicators	5-20
	JLAN LEDs.....	5-20
	SCSI Activity LEDs	5-20
	LE1 LED	5-21
	Unit Identifier (UID)	5-21
5-11	Floppy, IDE and SCSI Drive Connections.....	5-22
	Floppy Connector.....	5-22
	IDE Connectors	5-23
	SCSI Connectors	5-24

Chapter 6: Advanced Chassis Setup

6-1	Static-Sensitive Devices	6-1
6-2	Control Panel.....	6-2
6-3	System Fans.....	6-3
	System Fan Failure	6-3
	Replacing System Cooling Fans.....	6-3
6-4	Drive Bay Installation/Removal.....	6-4
	Accessing the Drive Bays	6-4
	SCSI/SATA Drive Installation.....	6-5
	DVD/CD-ROM and Floppy Drive Installation	6-7
6-5	Power Supply.....	6-8
	5015P-8R/5015P-TR: Power Supply Failure	6-8
	5015P-8R/5015P-TR: Removing/Replacing the Power Supply	6-8
	5015P-8/5015P-T: Power Supply Failure	6-9
	5015P-8/5015P-T: Removing/Replacing the Power Supply.....	6-9

Chapter 7: BIOS

7-1	Introduction	7-1
7-2	Running Setup	7-2
7-3	Main BIOS Setup	7-2
7-4	Advanced Setup	7-7
7-5	Security	7-18
7-6	Boot	7-20
7-7	Exit	7-21

Appendices:

Appendix A: BIOS POST Messages	A-1
Appendix B: BIOS POST Codes	B-1
Appendix C: Software Installation	C-1
Appendix D: System Specifications	D-1

Notes

Chapter 1

Introduction

1-1 Overview

The SuperServer 5015P-8(R)/5015P-T(R) is a high-end server comprised of two main subsystems: the SC816S-400(R)/SC816T-400(R) 1U server chassis and the PDSMP-8/PDSMP-i single processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperServer 5015P-8(R)/5015P-T(R) (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the 5015P-8(R)/5015P-T(R), as listed below:

- One (1) slim floppy drive [FPD-TEAC-S(B)]
- One (1) slim 8x DVD/24x CD-ROM drive [DVM-PNSC-824(B)]
- Three (3) 4-cm counter-rotating chassis cooling fans (FAN-0085)
- One (1) front control panel cable
- One (1) rackmount kit (CSE-PT51)
- Riser Cards: (see section 5-6 for details)
 - One (1) riser card (CSE-RR1U-X) for PCI-X add-on card
 - One (1) riser card (CSE-RR1U-XR) for PCI-X add-on card
 - One (1) riser card (CSE-RR1U-ER) for PCI-E add-on card
- SCSI Accessories [5015P-8(R) only]
 - Four (4) SCA SCSI hard drive carriers (CSE-PT-39(B))
 - One (1) SCSI backplane (CSE-SCA-814S)
 - One (1) Ultra320 SCSI cable (CBL-0063)
- Serial ATA Accessories [5015P-T(R) only]
 - One (1) Serial ATA backplane (CSE-SAS-816A)
 - One (1) SATA 4-lane cable (CBL-0096)
 - Four (4) SATA drive carriers [CSE-PT39(B)]
- One (1) passive heatsink for 1U systems (SNK-P0016)

- One (1) CD containing drivers and utilities
- SuperServer 5015P-8(R)/5015P-T(R) User's Manual

Note: (B) indicates the item is available in black.

1-2 Serverboard Features

At the heart of the SuperServer 5015P-8(R)/5015P-T(R) lies the PDSMP-8/PDSMP-i, a single processor serverboard based on Intel's E7230 chipset. Below are the main features of the PDSMP-8/PDSMP-i (see Figure 1-1 for a block diagram of the chipset).

Processors

The PDSMP-8/PDSMP-i supports single Intel Pentium® D, Pentium 4 Extreme, Pentium 4 or Celeron® D processors type processors. Please refer to the serverboard description pages on our web site for a complete listing of supported processors.

Memory

The PDSMP-8/PDSMP-i has four 240-pin DIMM sockets that can support up to 8 GB of unbuffered ECC or non-ECC DDR2-667/533/400 SDRAM. Memory can be installed in either a single or a dual channel (interleaved) configuration, which requires modules of the same size and speed to be installed in pairs. Please refer to Chapter 5 for details on installing memory.

SCSI Subsystem [5015P-8(R)]

The PDSMP-8 includes onboard Adaptec AIC-7902 dual-channel SCSI controller, which supports four 80-pin SCA Ultra320 SCSI hard drives. (Standard 1" drives are supported. SCA = Single Connection Attachment.) The SCSI drives are connected to an SCA backplane that provides power, bus termination and configuration settings. The SCSI drives are hot-swappable units.

Serial ATA [5015P-T(R)]

The PDSMP-i uses an SATA controller integrated in the ICH7R portion of the chipset to provide a four-port Serial ATA subsystem, which is RAID 0, 1, 5 and 10 supported. The SATA drives are hot-swappable units.

Notes: The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the Serial ATA drives.

Onboard Controllers/Ports

One floppy drive controller and a single-channel ATA/100 controller are provided to support up to two IDE hard drives or ATAPI devices. A second IDE slot can be used for compact flash cards (only). The color-coded I/O ports include one COM port, a VGA (monitor) port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two gigabit Ethernet ports. An external SCSI port is also included on the PDSMP-8.

ATI Graphics Controller

Both serverboards feature an integrated ATI video controller based on the Rage XL graphics chip. Rage XL fully supports sideband addressing and AGP texturing. This onboard graphics package can provide a bandwidth of up to 512 MB/sec over a 32-bit graphics memory bus.

Other Features

Other onboard features that promote system health include onboard voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

1-3 Server Chassis Features

The SuperServer 5015P-8(R)/5015P-T(R) is built upon the SC816S-400(R)/SC816T-400(R) 1U server chassis. The following is a general outline of the main features of the SC816S-400(R)/SC816T-400(R) chassis.

System Power

The 5015P-8 and the 5015P-T feature a single 400W cold-swap power supply. Power must be removed from the system before servicing or replacing the power supply.

The 5015P-8(R) and the 5015P-T(R) feature a redundant 400W hot-swap power supply. Power does not need to be removed from the system before servicing or replacing one of the two power supply modules.

SCSI/Serial ATA Subsystem

The SC816S-400(R)/SC816T-400(R) chassis was designed to support four SCSI/Serial ATA hard drives, which are hot-swappable units.

Note: The operating system you use must have RAID support to enable the hot-swap capability of the SCSI/SATA drives.

PCI Expansion Slots

The 5015P-8(R)/5015P-T(R) accommodates the use of one standard size 133 MHz PCI-X or PCI-Express x4 add-on card and one low profile 100 MHz PCI-X add-on card (all with riser cards). See Section 5-6 for details.

Front Control Panel

The SC816S-400(R)/SC816T-400(R)'s control panel provides you with system monitoring and control. LEDs indicate UID, system power, HDD activity, network activity (2) and overheat/fan failure. A main power button and a UID button are also included.

I/O Backplane

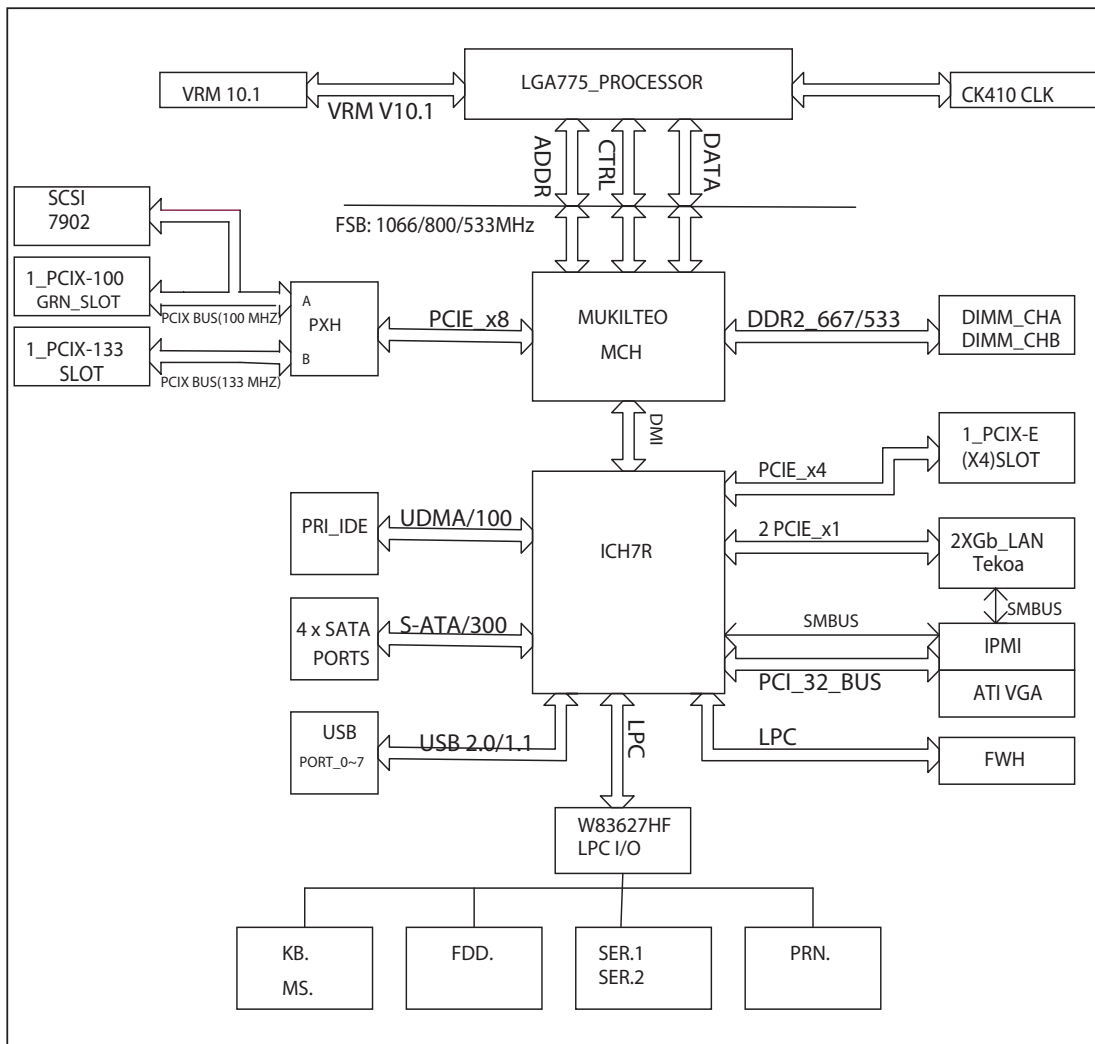
Ports on the I/O backplane include one COM port, a VGA port, two USB ports, PS/2 mouse and keyboard ports, two gigabit Ethernet ports and a UID button/LED. A SCSI port is also included on the SC816S-400(R).

Cooling System

The SC816S-400(R)/SC816T-400(R) chassis has an innovative cooling design that features three sets of 40-mm counter-rotating fans located in the middle section of the chassis. There is a "Fan Speed Control Mode" setting in BIOS (see Chapter 7) that allows chassis fan speed to be determined by system temperature [recommended setting is "3-pin (Server)"]. The power supply module(s) also includes a cooling fan.

**Figure 1-1. Intel E7230 Chipset:
System Block Diagram**

Note: This is a general block diagram. Please see Chapter 5 for details.



1-4 Contacting Supermicro

Headquarters

Address: Super Micro Computer, Inc.
980 Rock Ave.
San Jose, CA 95131 U.S.A.

Tel: +1 (408) 503-8000

Fax: +1 (408) 503-8008

Email: marketing@supermicro.com (General Information)
support@supermicro.com (Technical Support)

Web Site: www.supermicro.com

Europe

Address: Super Micro Computer, B.V.
Het Sterrenbeeld 28, 5215 ML
's-Hertogenbosch, The Netherlands

Tel: +31 (0) 73-6400390

Fax: +31 (0) 73-6416525

Email: sales@supermicro.nl (General Information)
support@supermicro.nl (Technical Support)
rma@supermicro.nl (Customer Support)

Asia-Pacific

Address: Super Micro Computer, Inc.
4F, No. 232-1, Liancheng Rd.
Chung-Ho 235, Taipei County
Taiwan, R.O.C.

Tel: +886-(2) 8226-3990

Fax: +886-(2) 8226-3991

Web Site: www.supermicro.com.tw

Technical Support:

Email: support@supermicro.com.tw

Tel: 886-2-8228-1366, ext.132 or 139

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 5015P-8(R)/5015P-T(R) up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperServer 5015P-8(R)/5015P-T(R) was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the 5015P-8(R)/5015P-T(R). It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 5015P-8(R)/5015P-T(R) was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
- This product is not suitable for use with visual display work place devices according to §2 of the the German Ordinance for Work with Visual Display Units.



Warnings and Precautions!



Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SATA drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (T_{mra}).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4 Installing the System into a Rack

This section provides information on installing the 5015P-8(R)/5015P-T(R) into a rack unit with the rack rails provided. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

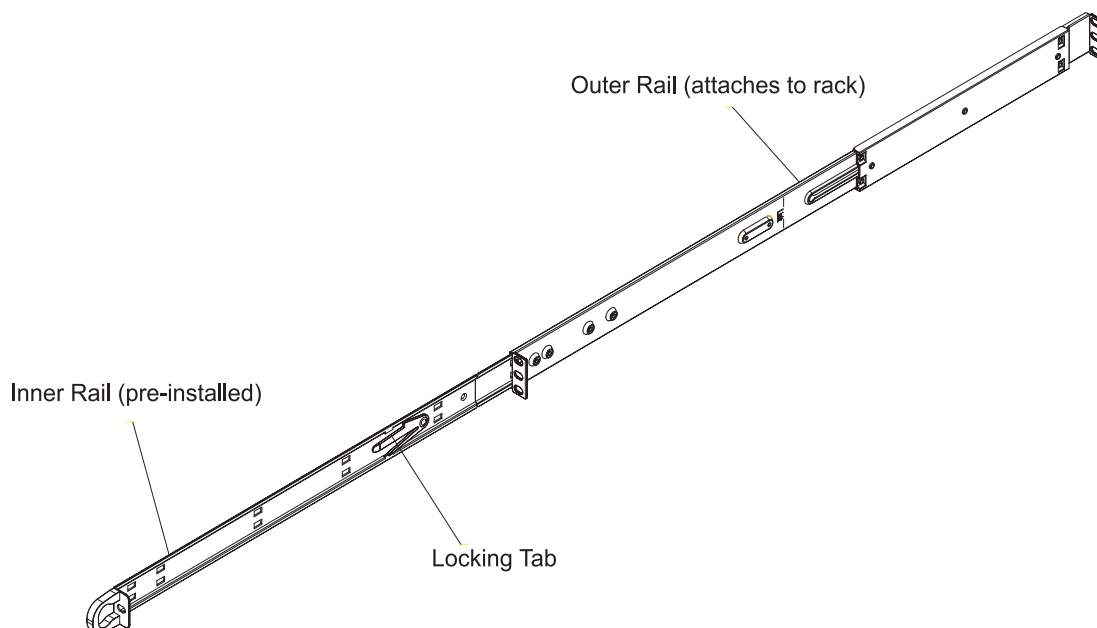
Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself (see Figure 2-1). Two pairs of short brackets to be used on the front side of the outer rails are also included.

Installing the Inner Rails

Both the left and right side inner rails have been pre-attached to the chassis. Proceed to the next step. A

**Figure 2-1. Identifying the Sections of the Rack Rails
(right side rail shown)**



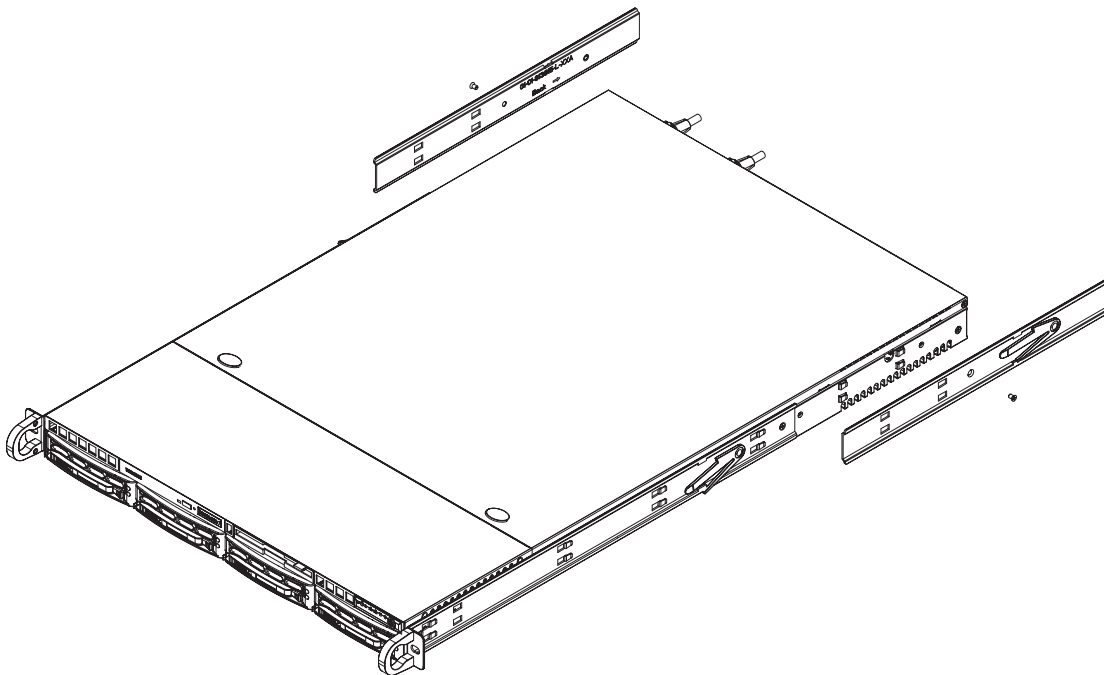
Installing the Outer Rails

Begin by measuring the distance from the front rail to the rear rail of the rack. Attach a short bracket to the front side of the right outer rail and a long bracket to the rear side of the right outer rail. Adjust both the short and long brackets to the proper distance so that the rail can fit snugly into the rack. Secure the short bracket to the front side of the outer rail with two M4 screws and the long bracket to the rear side of the outer rail with three M4 screws. Repeat these steps for the left outer rail.

Locking Tabs

Both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Figure 2-2. Installing the Rack Rails

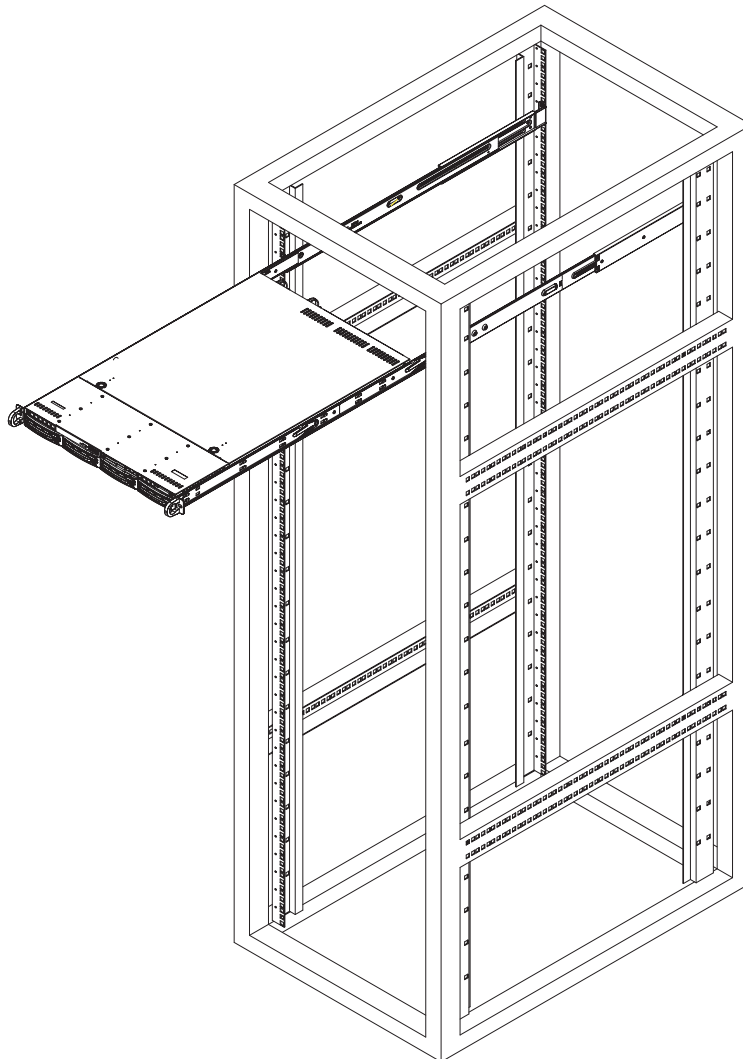


Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-3.

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumbscrews that hold the front of the server to the rack.

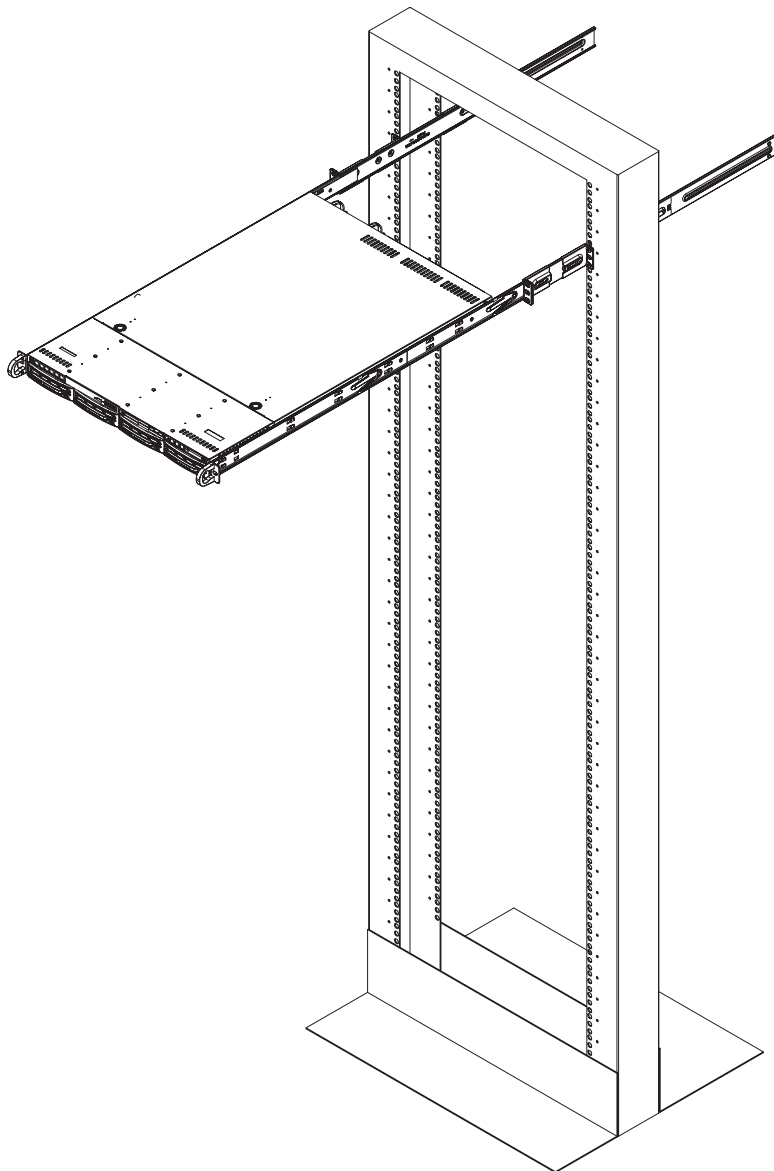
Figure 2-3. Installing the Server into a Rack



Installing the Server into a Telco Rack

To install the SuperServer 5015P-8(R)/5015P-T(R) into a Telco type rack, use two L-shaped brackets on either side of the chassis (four total). First, determine how far the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack. See Figure 2-4.

Figure 2-4. Installing the Server into a Telco Rack



2-5 Checking the Serverboard Setup

After you install the 5015P-8(R)/5015P-T(R) in the rack, you will need to open the top cover to make sure the serverboard is properly installed and all the connections have been made.

1. Accessing the inside of the system (see Figure 2-5)

First, release the retention screws that secure the system to the rack. Grasp the two handles on either side and pull the system straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover (1). Push the cover away from you (toward the rear of the chassis) until it stops (2). You can then lift the top cover from the chassis to gain full access to the inside of the server.

To remove the system from the rack completely, depress the locking tabs in the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position.

2. Check the CPUs (processors)

You may have a processor already installed in the serverboard. The processor needs a heatsink installed. See Chapter 5 for instructions on processor and heatsink installation.

3. Check the system memory

Your server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

4. Installing add-on cards

If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

5. Check all cable connections and airflow

Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

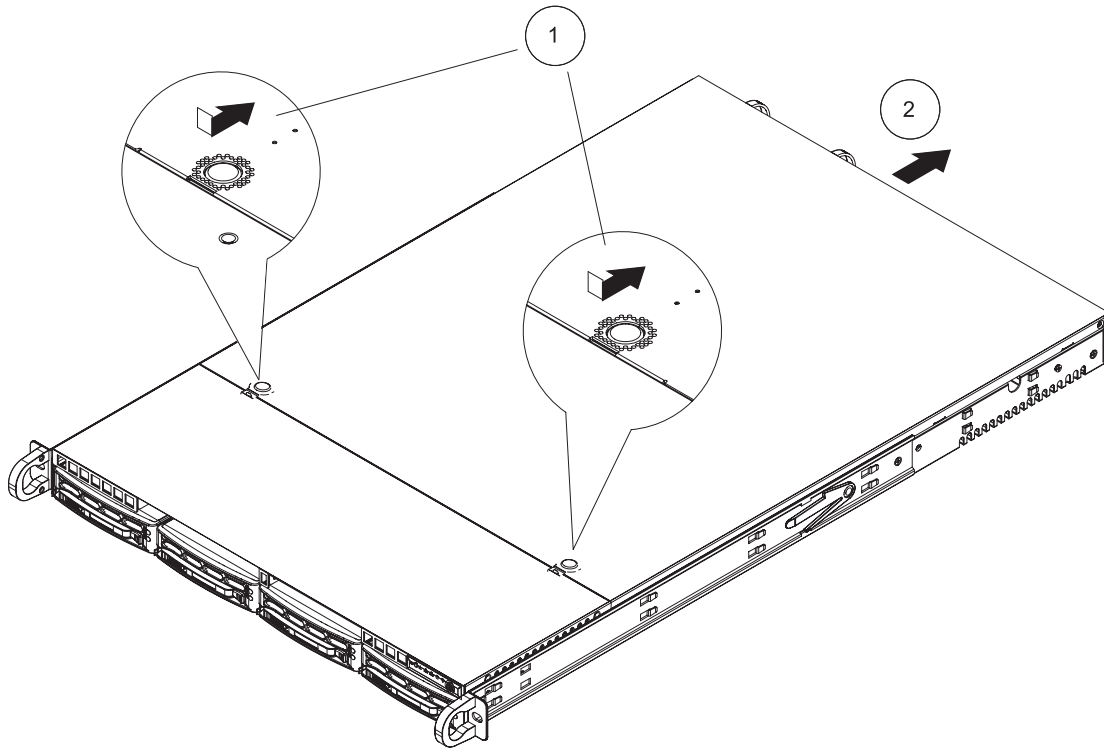


Figure 2-5. Accessing the Inside of the System

2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SCSI/SATA drives and SCSI/SATA backplane have been properly installed and all connections have been made.

1. Accessing the drive bays

All drives are accessible from the front of the server. For servicing the DVD-ROM and floppy drives, you will need to remove the top chassis cover. The SCSI/SATA disk drives can be installed and removed from the front of the chassis without removing the top chassis cover.

2. DVD-ROM and floppy disk drives

A slim DVD-ROM and floppy drive should be preinstalled in your server. Refer to Chapter 6 if you need to reinstall a DVD-ROM and/or floppy disk drive to the system.

3. Check the SCSI/SATA disk drives

Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SCSI/SATA drives, please refer to Chapter 6.

4. Check the airflow

Airflow is provided by three sets of 40-mm fans (each set of fans consists of two fans that are mounted back to back). The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

5. Supplying power to the system

The last thing you must do is to provide input power to the system. Plug the power cord(s) from the power supply module(s) into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS) source.

Chapter 3

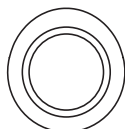
System Interface

3-1 Overview

There are several LEDs on the chassis control panel as well as others on the SCSI/SATA drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis. These are (in order from left to right) a UID button and a power on/off button.



- **UID:** Depressing the UID (unit identifier) button illuminates an LED on both the front and rear of the chassis for easy system location in large stack configurations. The LED will remain on until the button is pushed a second time. Another UID button on the rear of the chassis serves the same function.



- **POWER:** This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC816S-400(R)/SC816T-400(R) chassis has six LEDs, which provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



- **UID:** This LED turns on when either the front or the rear UID button is pushed. Pushing either button a second time will turn this LED off.



- **Overheat/Fan Fail:** When this LED flashes it indicates a fan failure. When on continuously (on and not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the overheat condition exists.



- **NIC2:** Indicates network activity on GLAN2 when flashing.



- **NIC1:** Indicates network activity on GLAN1 when flashing.



- **HDD:** Indicates hard drive activity. On the SuperServer 5015P-8(R)/5015P-T(R) this light indicates SCSI/SATA and/or DVD-ROM drive activity when flashing.



- **Power:** Indicates power is being supplied to the system's power supply module(s). With the 5015P-8/5015P-T, this LED should always be green when the system is operating. On the 5015P-8R/5015P-TR, this LED turns amber in the event of a power supply failure or if a power supply cord is disconnected or loose.

3-4 SCSI/SATA Drive Carrier LEDs

5015P-8(R): Each SCSI drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the SCSI drive carrier indicates drive activity. A connection to the SCSI SCA backplane enables this LED to blink on and off when that particular drive is being accessed.
- **Red:** The SAF-TE compliant backplane activates the red LED to indicate a drive failure. If one of the SCSI drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SCSI drives.

5015P-T(R): Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the Serial ATA drive carrier) indicates drive activity. A connection to the Serial ATA backplane enables this LED to blink on and off when that particular drive is being accessed. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

Note: The second LED on the SATA carriers is not used.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions



Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 5015P-8(R)/5015P-T(R) from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and the DVD-ROM and floppy drives (not necessary for SCSI and SATA drives). When disconnecting power, you should first power down the system with the operating system and then unplug the power cords of all the power supply modules in the system.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.
- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.
- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.
- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions



Follow these rules to ensure general safety:

- Keep the area around the SuperServer 5015P-8(R)/5015P-T(R) clean and free of clutter.
- The SuperServer 5015P-8(R)/5015P-T(R) weighs approximately 57(60) lbs (25.9/27.3 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal

conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions



Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

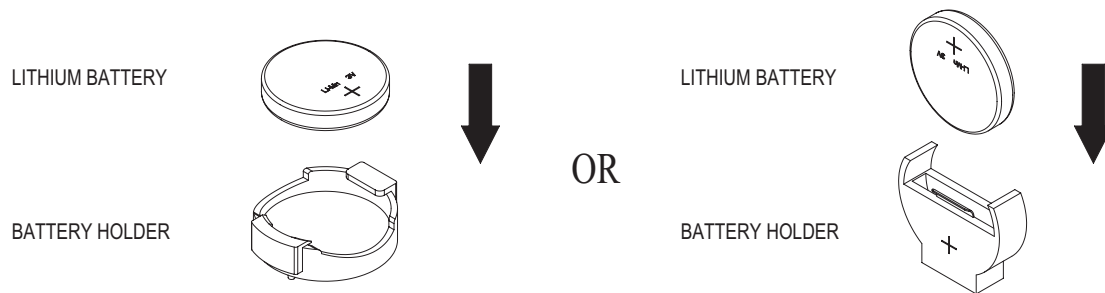
- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions



Care must be taken to assure that the chassis cover is in place when the 5015P-8(R)/5015P-T(R) is operating to ensure proper cooling. Out of warranty damage to the 5015P-8(R)/5015P-T(R) system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install processors, memory and heat-sinks to the PDSMP-8/PDSMP-i serverboard, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the serverboard to protect and cool the system.

5-1 Handling the Serverboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the serverboard can cause it to bend if handled improperly, which may result in damage. To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.

Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

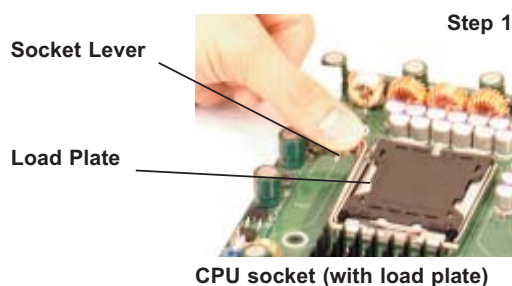
5-2 Processor and Heatsink Installation



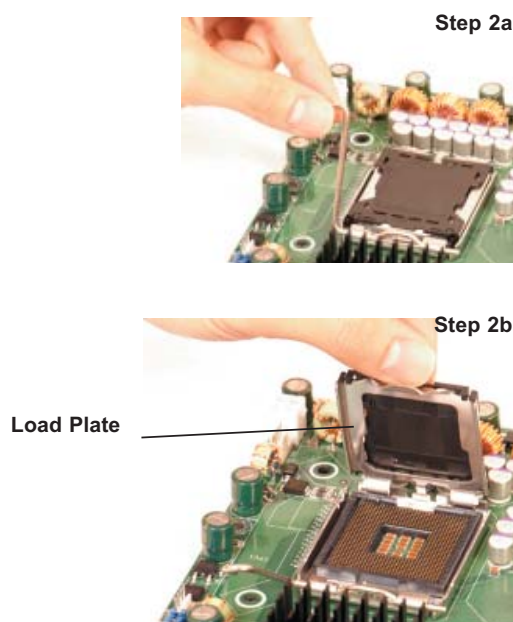
Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

The PDSMP-8/PDSMP-i has a single LGA775 socket that supports Intel Pentium® D, Pentium 4 Extreme, Pentium 4 or Celeron® D processors type processors.

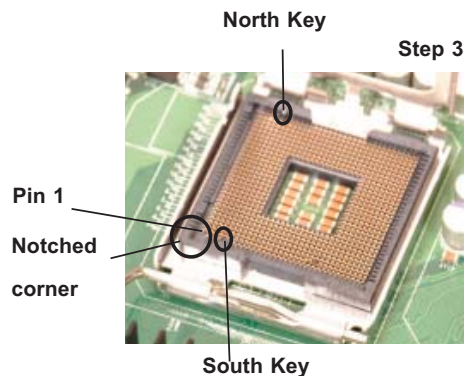
1. Press the socket lever to release the load plate that covers the CPU socket from its locking position.



2. Carefully lift the socket lever up to open the load plate.



3. Locate Pin 1 on the CPU socket. (Pin 1 is closest to the notched corner of the housing.) Please note that a North key and a South key (notches) are located at opposite sides of the CPU housing.



4. Use your thumb and index finger to hold the CPU at the north center and south center edges of the CPU.

5. Align Pin 1 of the CPU with Pin 1 of the socket. Once aligned, carefully lower the CPU straight down and into the socket. *Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface of the socket or against any pins of the socket, which may damage the CPU and/or the socket.*

6. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

7. Use your thumb to gently press the lever down and lock it in the hook.

8. If the CPU is properly installed into the socket, the black plastic cover will be automatically released from the load plate when the lever is pushed into the hook. Remove the cover from the motherboard.

Note: Keep the plastic cap. If you need to ship the motherboard, the CPU must have the plastic cap properly installed to protect the CPU pins. Shipping without the CPU plastic cap properly installed will void the warranty.

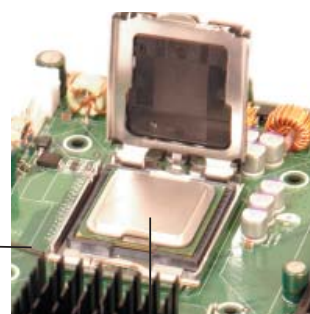
North Center Edge

Step 4



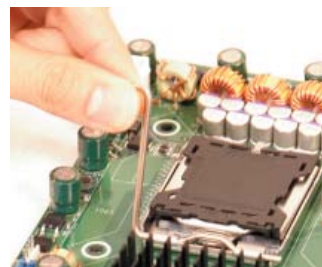
South Center Edge

Steps 5 & 6



CPU in the socket

Step 7



Step 8



Plastic cap is released from the load plate when the CPU is properly installed.

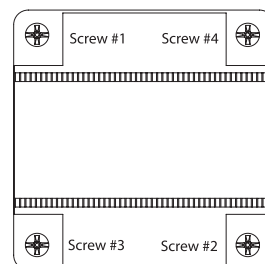
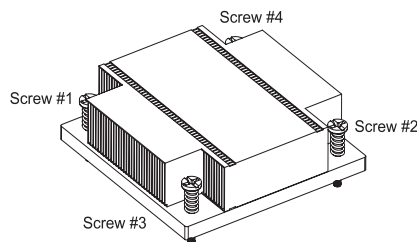
Installing the Heatsink

1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.

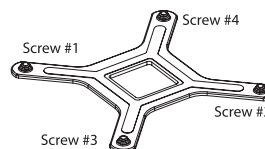
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

3. Screw in two diagonal screws (eg. the #1 and the #2 screws) until just snug (do not fully tighten the screws, which may damage the CPU).

4. Finish the installation by fully tightening all four screws.



**Retention mechanism
(preinstalled)**



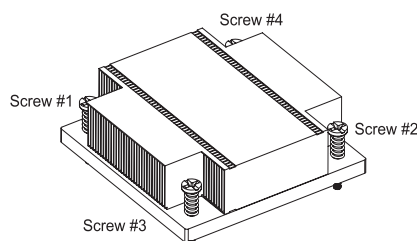
Heatsink Removal

1. Unscrew and remove the heatsink screws from in the sequence as show in the picture on the right.

2. Hold and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when loosening the heatsink!)

3. Once the heatsink is loosened, remove it from the CPU socket.

4. Clean the surfaces of the CPU and the heatsink to remove the old thermal grease. Reapply the proper amount of thermal grease on the surface before re-installing the heatsink.



5-3 Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the serverboard. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system, keep the airflow in mind when routing the cables. The following data cables (with their serverboard connector locations noted) should be connected. See the serverboard layout figure in this chapter for connector locations.

- SCSI cable, 5015P-8(R) only (JA1)
- Serial ATA 4-lane cables, 5015P-T(R) only (JSM1)
- DVD/CD-ROM cable (JIDE1)
- Floppy drive cable (JFDD1)
- Control panel cable (JF1, see next page)

Connecting Power Cables

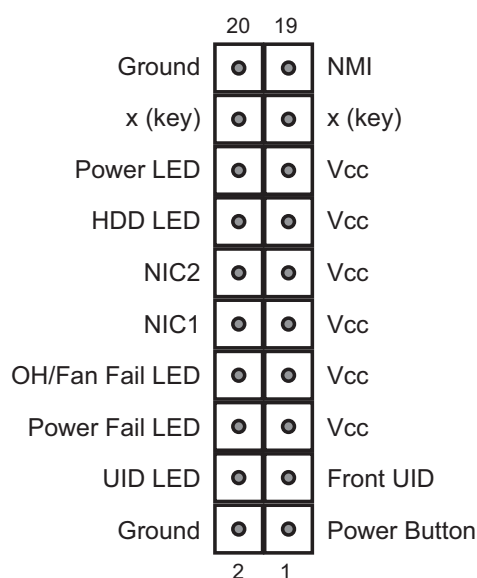
The PDSMP-8/PDSMP-i has a 20-pin primary ATX power supply connector designated "J43" for connection to the ATX power supply. Connect the appropriate connector from the power supply to the J43 connector to supply power to the serverboard. The 12V power connector at J15 must also be connected to your power supply. See the Connector Definitions section in this chapter for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators. Note that even and odd numbered pins are on opposite sides of each header.

All JF1 wires have been bundled into single ribbon cable to simplify their connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis. See the Connector Definitions section in this chapter for details and pin descriptions of JF1.

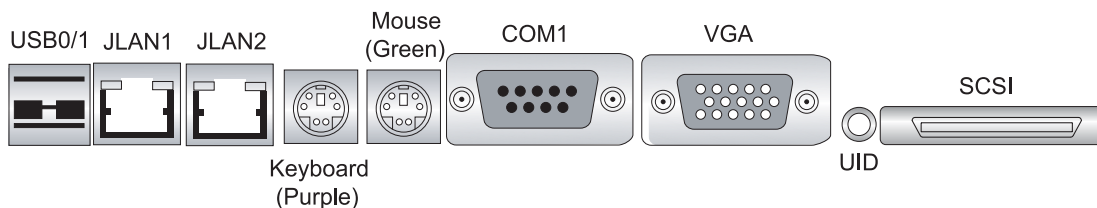
Figure 5-1. JF1 Header Pins



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. I/O Ports



Note: the SCSI port is on the PDSMP-8 only.

5-5 Installing Memory

Note: Check the Supermicro web site for recommended memory modules: <http://www.supermicro.com/support/resources/>

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

DIMM Installation (Figures 5-3a and 5-3b)

1. Insert each DDR2 memory module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the module incorrectly. (See support information below.)
2. Gently press down on the memory module until it snaps into place.

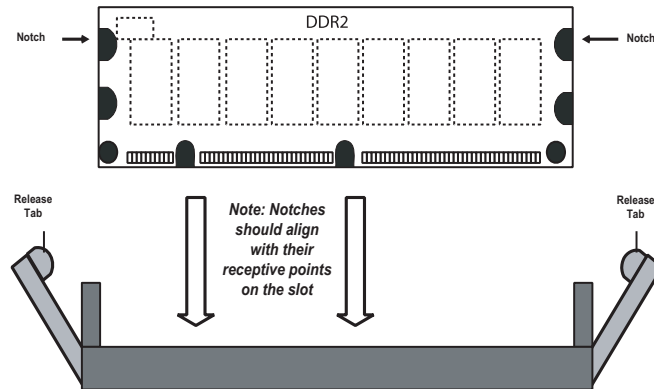
Memory Support

The PDSMP-8/i supports unbuffered ECC DDR2-667/533/400 type SDRAM. Both interleaved and non-interleaved schemes are supported, so you may populate any number of DIMM slots. Populating DIMM#1A and DIMM#1B and/or DIMM#2A and DIMM#2B with memory modules of the same size and speed will result in dual channel, two-way interleaved memory, which is faster than single channel, non-interleaved memory. When ECC memory is used, it may take 25-40 seconds for the VGA to display.

Notes:

1. Due to chipset limitations, 8GB memory can only be supported by the following operating systems:
32-Bit: Windows 2000 Advanced Server, Windows Server 2003 Enterprise Edition
64-Bit: Windows Server 2003 Standard x64 Edition, Windows XP Professional x64 Edition, Windows Server 2003 Enterprise x64 Edition
2. You may install 2 GB size DIMMs in each slot; however, only with DDR2-533 modules.
3. Some old versions of DDR2-667 may not match Intel's On-Die-Temperature requirement and will automatically be down-graded to run at 533 MHz. If this occurs, contact your memory vendor to check the ODT value.

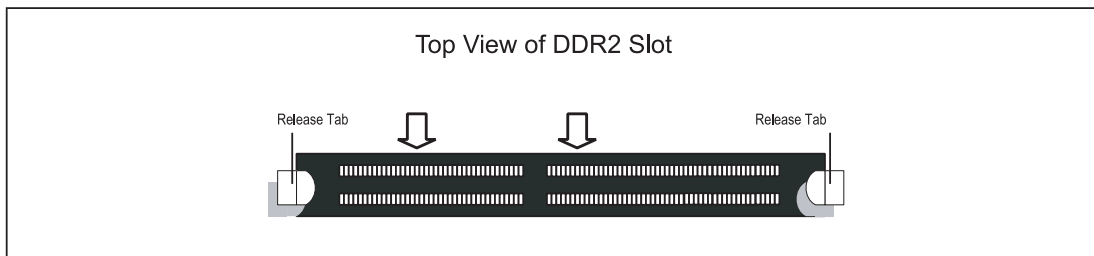
Figure 5-3a. Installing DIMMs



To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notch.

To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

Figure 5-3b. Top View of DDR2 Slot



5-6 Adding PCI Cards

1. PCI slots

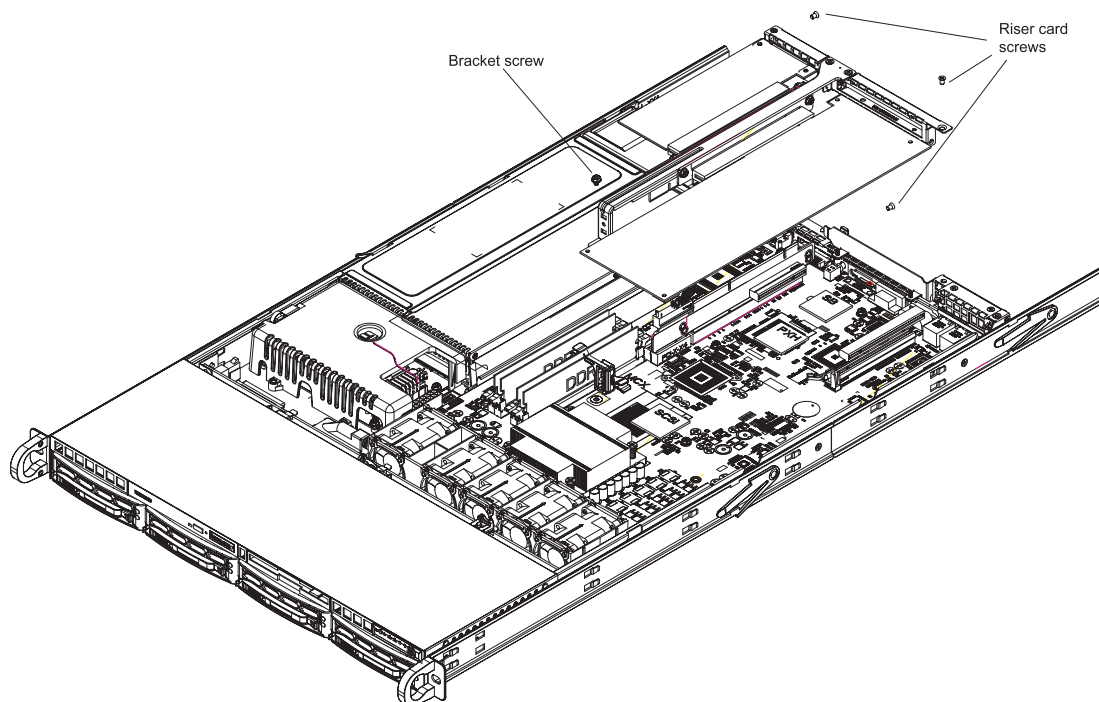
Your system includes riser cards to accommodate the use of one or two PCI expansion cards. The 5015P-8(R)/5015P-T(R) supports the use of one standard size 133 MHz PCI-X or PCI-Express x4 add-on card and one low profile 100 MHz PCI-X add-on card.

2. PCI card installation

Before installing a PCI add-on card, make sure you install it into the riser card and slot that supports the speed of the card (see step 1 above - you may need to change the installed riser card with a boxed one to support the type of add-on card you wish to install). The system should be powered off when installing cards.

Begin by removing the top chassis cover. Both riser cards are attached to a bracket that runs length-wise through the chassis. Remove the three screws that secure the riser cards to the rear of the chassis and the screw that secures the bracket to the chassis (see Figure 5-4) then lift the bracket/riser card assembly from the chassis. Insert the PCI card(s) into the correct riser slot(s), pushing down with your thumbs evenly on both sides of the card - note that each add-on card attaches to the riser card with a single screw. After the card(s) have been installed, position the bracket/riser card assembly back on the chassis making sure the cards insert properly into the slots on the board, then secure it with the same four screws you removed previously. Finish by replacing the chassis cover.

Figure 5-4. Adding a PCI Card



PDSMP-8/PDSMP-i Quick Reference

Jumpers	Description	Default Setting
J51/J52	SMB to PCI Slots	Both Open (Disabled)
JBT1	CMOS Clear	See Section 5-9
JP17*	Compact Flash Master/Slave	Closed: Master
JPA1**	SCSI Channel En/Disable	Pins 1-2 (Enabled)
JPF1	Power Force-On	Open (Disabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1/JPL2	JLAN1/JLAN2 En/Disable	Pins 1-2 (Enabled)
JWD	Watch Dog En/Disable	Pins 1-2 (Reset)
Connectors	Description	
COM1/COM2	COM Port1 & COM Port 2 Connector/Header	
Fan 1-6	CPU/Chassis/System Fan Headers	
J15	12V Processpr Power Connector (required connection)	
J43	ATX 20-Pin Power Connector	
J48	USB2/3 Headers	
J50	USB4/5 Headers	
JA1/JB1**	SCSI Channel A/SCSI Channel B Connectors	
JD1	Speaker Header	
JF1	Front Panel Control Header	
JFDD1	Floppy Disk Connector	
JIDE1	IDE Hard Disk Drive Connector	
JIDE2	Compact Flash Card Connector	
JL1	Chassis Intrusion Header	
JLAN1/JLAN2	Ethernet RJ45 (Gigabit LAN) Ports	
JPB1	Unit Identifier	
JS10	System Management Bus	
JSM1	SATA Headers (4)	
JWF1	Power Supply Header for Compact Flash Card	
JWOL1	Wake On LAN Header	
JWOR	Wake On Ring Header	
USB0/1	Backpanel Universal Serial Ports 0/1	
Onboard Indicators	Description	
DA1/DA2	SCSI Channel A/SCSI Channel B Activity LEDs	
LE1	Onboard +5vsb warning LED Indicator	

*For JP17 to work properly, you need to connect the Compact Flash card's power cable to JWF1 first.

**PDSMP-8 only

5-8 Connector Definitions

ATX Power Connector

The main power supply connector on the PDSMP-8/PDSMP-i meets the SSI (Superset ATX) specification. You can only use a 20-pin power supply cable on the serverboard. Make sure that the orientation of the connector is correct. You must also use the processor power connector (J15, below.) See the table on the right for pin definitions.

ATX Power 20-pin Connector Pin Definitions (J43)			
Pin#	Definition	Pin #	Definition
11	GND8	1	GND1
12	+5V1	2	GND2
13	+5V2	3	GND3
14	3.3V1	4	GND4
15	3.3V2	5	GND5
16	+5V/SB	6	GND6
17	+12V4	7	GND7
18	+12V5	8	+12V1
19	+12V6	9	+12V2
20	Blcoked	10	+12V3

Processor Power Connector

In addition to the Primary ATX power connector (above), the 12V processor power connector at J15 must also be connected to your power supply to provide adequate power supply to the system.

Processor Power Connector Pin Definitions (J15)			
Pin#	Definition	Pin#	Definition
1	SCLK	2	GND2
3	SDATA	4	SALERT
5	GND1	6	PWR_OK
7	PWR_ON	8	-12V
9	Reserved	10	NC

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	Vcc
16	Control

HDD LED

The HDD LED (for IDE and SATA drives) connection is located on pins 13 and 14 of JF1. Attach the drive LED cable to these pins to display disk activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HD Active

NIC1/2 LEDs

The NIC (Network Interface Controller) LED connections for JLAN1 are located on pins 9 and 10 of JF1 and the NIC LED connections for JLAN2 are located on pins 11 and 12 of JF1. Attach the NIC cables to display network activity. Refer to the table on the right for pin definitions.

NIC1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
10/12	Ground

Overheat/Fan Fail LED

Connect an LED to the OH/Fan Fail connection on pins 7 and 8 of JF1 to provide warning of system overheating or system fan failure. The LED will flash/stay on as long as the fan fail/overheat condition exists. Refer to the table on the right for pin definitions and Chapter 3 for details.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Ground

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

Power Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	Vcc
6	Ground

UID Button & UID LED

A Unit Identifier button/LED is located next to the VGA port on the rear of the chassis and a UID LED and button (separate) are located on the front control panel. The UID LED connection is located on pins 3 and 4 of JF1. Refer to the table on the right for pin definitions and to section 5-10 for details.

UID & UID_LED Pin Definitions (JF1)	
Pin#	Definition
3	Front UID Button
4	UID_LED

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see setting in BIOS). To turn off power in suspend mode, depress the button for at least 4 seconds.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	PW_ON
2	Ground

JLAN1/2 (Ethernet Ports)

Two gigabit Ethernet ports are located beside the VGA port. These ports accept RJ45 type cables.



Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

Universal Serial Bus (USB0/1)

Two USB 2.0 ports are located beside the LAN ports. USB0 is the bottom port and USB1 is the top port. See the table on the right for pin definitions.

Universal Serial Bus Pin Definitions (USB0/1)			
USB0		USB1	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	N/A	5	Key

Universal Serial Bus Headers

Two extra USB headers at J48 (USB2/3) and J50 (USB4/5) can be used for front side USB access. You will need a USB cable to use these connections. Refer to the tables on the right for pin definitions.

USB Headers Pin Definitions (J48, J50)			
USB2		USB3	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	N/A	5	N/A

Fan Headers

There are three fan headers on the PDSMP-8/PDSMP-i. Each 6-pin header controls two fans. The fans use DC power. See the table on the right for fan pin definitions.

Note: Fan speed is controlled by the "Fan Speed Control Mode" setting in BIOS (see Chapter 7).

Fan Header Pin Definitions (Fan1-6)		
Pin#	Definition	Color
1	Fan Power	Red
2	Tachometer	Yellow
3	Ground	Black
4	Ground	Grey
5	Tachometer	White
6	Fan Power	Orange

Power LED/Speaker

On the JDI header, pins 1-3 are for a power LED and pins 4-7 are for the speaker. See the table on the right for speaker pin definitions.

Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

Speaker Connector Pin Definitions (JD1)		
Pin #	Function	Definition
4	+	Speaker data (red wire)
5	Key	No connection
6		Key
7		Speaker data

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-On-Ring Pin Definitions (JWOR)	
Pin#	Definition
1	Ground (Black)
2	Wake-up

Wake-On-LAN

The Wake-On-LAN (JWOL1) header is located next to JWOR. See the table on the right for pin definitions. You must enable the LAN Wake-Up function in the BIOS and also have a LAN card with a Wake-on-LAN connector and cable to use this feature.

Wake-On-LAN Pin Definitions (JWOL)	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

SMB

A System Management Bus header is located at JS10. Connect the appropriate cable here to utilize SMB on your system.

SMB Header Pin Definitions (JS10)	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse ports are located beside the VGA port. See the table at right for pin definitions. (See Figure 5-4 for locations.)

PS/2 Keyboard and Mouse Port Pin Definitions	
Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Serial Ports

One backpanel COM port and one COM header (located near JF1) are included on the serverboard. See the table on the right for pin definitions.

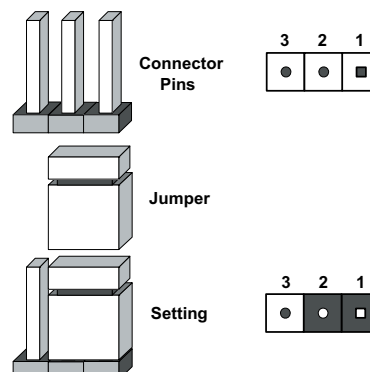
Serial Port Pin Definitions (COM1/COM2)			
Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: Pin 10 is included on the header but not on the port. NC indicates no connection.

5-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout pages for jumper locations.



Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,

- 1) First power down the system and unplug the power cord(s)
- 2) With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver
- 3) Remove the screwdriver (or shorting device)
- 4) Reconnect the power cord(s) and power on the system.

Note: Do not use the PW_ON connector to clear CMOS.

JLAN Enable/Disable

Change the setting of jumper JPL1 and JPL2 to enable or disable the JLAN1 and JLAN2 ports, respectively. See the table on the right for jumper settings. The default setting is enabled

JLAN Enable/Disable Jumper Settings (JPL1, JLAN2)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

VGA Enable/Disable

JPG1 enables or disables the VGA port on the serverboard. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SMBus to PCI Slots

Jumpers J51 and J52 allow you to connect the PCI-X/PCI-E slots to the System Management Bus. The default setting is open to disable the connection. See the table on the right for jumper settings.

SMBus to PCI Jumper Settings (J51, J52)	
Jumper Setting	Definition
Closed	Enabled
Open	Disabled

SCSI Enable/Disable

The JPA1 jumper allows you to enable or disable the onboard SCSI controller. The normal (default) position is on pins 1-2 to enable SCSI. See the table on the right for jumper settings.

SCSI Enable/Disable Jumper Settings (JPA1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog

JWD1 controls Watch Dog, a system monitor that takes action when a software application freezes the system. Jumping pins 1-2 will cause WD to reset the system if an application is hung up. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that is hung up. See the table on the right for jumper settings. Watch Dog can also be enabled via BIOS.

Note: When enabled, the user needs to write their own application software to disable the Watch Dog Timer.

Watch Dog Jumper Settings (JWD1)	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

Compact Flash Master/Slave

The JP17 jumper allows you to set either master or slave status to the compact flash card. See the table on the right for jumper settings.

Compact Flash Master/Slave Jumper Settings (JP17)	
Jumper Setting	Definition
Closed	Master
Open	Slave

Power Force On

Jumper JPF1 allows you to enable or disable the Power Force-On function. If enabled, the power will always stay on automatically. If disabled (the default setting), the user must press the power button to power on the system.

Power Force-On Jumper Settings (JPF1)	
Jumper Setting	Definition
Open	Disabled
Closed	Force Pwr On

5-10 Onboard Indicators

JLAN LEDs

The Gigabit Ethernet LAN ports (located beside the USB ports) each have two LEDs. The right LED indicates activity while the left LED may be green, amber or off to indicate the speed of the connection. See table at right for the functions associated with the connection speed LED.

JLAN Left LED (Connection Speed Indicator)	
LED Color	Definition
Off	10 MHz
Green	100 MHz
Amber	1 GHz

SCSI Activity LEDs

Two LEDs on the serverboard are used to indicate SCSI channel activity. DA1 indicates activity on channel A and DA2 indicates activity on channel B.

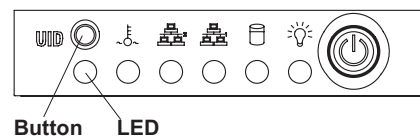
LE1 LED

When illuminated, the LE1 LED indicates the presence of +5vsb on the serverboard. If on, remove power from the power supply before removing any system components such as processors or memory (not necessary for SCSI or SATA drives).

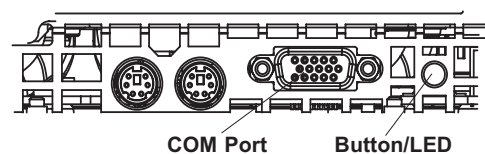
Unit Identifier

A Unit Identifier (UID) feature on the server makes it easy to locate the unit in a large stack. While servicing the system, if you find you need to work on the other side of the unit, push the UID button (located on the far left of the control panel on the front and to the right of the VGA port on the rear of the chassis) to illuminate an LED on the other side of the chassis. When you walk around to the other side of the rack, the unit will then be easy to spot. The LED will remain on until the UID button is pushed again. The rear chassis UID at JPB1 is a button and LED in one. The front control panel includes a separate LED and button.

UID: Front Chassis Location



UID: Rear Chassis Location



5-11 Floppy, IDE and SCSI Drive Connections

Note the following when connecting the floppy and hard disk drive cables:

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

Floppy Connector

The floppy connector is located on JFDD1. See the table to the right for pin definitions.

Floppy Drive Connector Pin Definitions (JFFD1)			
Pin#	Definition	Pin #	Definition
1	Ground	2	FDHDIN
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	Index
9	Ground	10	Motor Enable
11	Ground	12	Drive Select B
13	Ground	14	Drive Select B
15	Ground	16	Motor Enable
17	Ground	18	DIR
19	Ground	20	STEP
21	Ground	22	Write Data
23	Ground	24	Write Gate
25	Ground	26	Track 00
27	Ground	28	Write Protect
29	Ground	30	Read Data
31	Ground	32	Side 1 Select
33	Ground	34	Diskette

IDE Connectors

There are no jumpers to configure the onboard IDE connector. See the table below for pin definitions.

IDE Drive Connector Pin Definitions (JIDE1)			
Pin#	Definition	Pin #	Definition
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	Ground	20	Key
21	DRQ3	22	Ground
23	I/O Write	24	Ground
25	I/O Read	26	Ground
27	IOCHRDY	28	BALE
29	DACK3	30	Ground
31	IRQ14	32	IOCS16
33	Addr1	34	Ground
35	Addr0	36	Addr2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	Ground

SCSI Connectors

Refer to the table at right for pin definitions for the Ultra320 SCSI connectors located at JA1 and JB1.

Ultra320 SCSI Drive Connectors Pin Definitions (JA1, JB1)			
Pin#	Definition	Pin #	Definition
1	+DB (12)	35	-DB (12)
2	+DB (13)	36	-DB (13)
3	+DB (14)	37	-DB (14)
4	+DB (15)	38	-DB (15)
5	+DB (P1)	39	-DB (P1)
6	+DB (0)	40	-DB (0)
7	+DB (1)	41	-DB (1)
8	+DB (2)	42	-DB (2)
9	+DB (3)	43	-DB (3)
10	+DB (4)	44	-DB (4)
11	+DB (5)	45	-DB (5)
12	+DB (6)	46	-DB (6)
13	+DB (7)	47	-DB (7)
14	+DB (P)	48	-DB (P)
15	Ground	49	Ground
16	DIFFSENS	50	Ground
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	Reserved	53	Reserved
20	Ground	54	Ground
21	+ATN	55	-ATN
22	Ground	56	Ground
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB (8)	65	-DB (8)
32	+DB (9)	66	-DB (9)
33	+DB (10)	67	-DB (10)
34	+DB (11)	68	-DB (11)

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC816S-400(R)/SC816T-400(R) chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the next step.

Tools Required

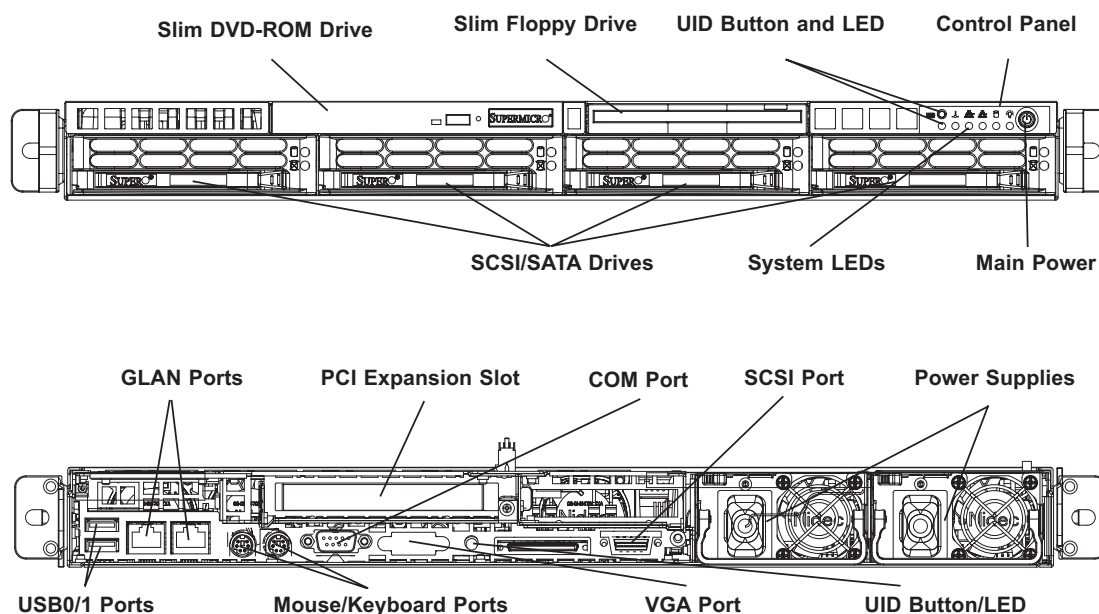
The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electrostatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Figure 6-1. Chassis: Front and Rear Views

Notes: the SCSI port is included on the 5015P-8/5015P-8R only. The 5015P-8 and 5015P-T share the same rear view as shown above but have a cover plate over the second (redundant) power supply module.

6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in "Chapter 5: Advanced Serverboard Setup."

6-3 System Fans

Three 40-mm fans provide the cooling for the 5015P-8(R)/5015P-T(R). Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels. These fans can adjust their speed according to the heat level sensed in the system, which results in more efficient and quieter fan operation. Fan speed is controlled by a setting in BIOS (see Chapter 7). Each fan in a set has its own separate tachometer.

It is very important that the chassis top cover is properly installed for the airflow to circulate properly through the chassis and cool the components.

System Fan Failure

If a fan fails, the remaining fans will ramp up to full speed and the overheat/fan fail LED on the control panel will blink on and off. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the two fan units has failed. Then power down the system before replacing a fan. Removing the power cord(s) is also recommended as a safety precaution.

Replacing System Cooling Fans

1. Removing a fan

With the system powered down, first remove the chassis cover (refer to page 6-7) and unplug **all** the fan cables from the serverboard. Grasp the rectangular housing that holds all the fan units and lift it out of the chassis (see Figure 6-2). Push the failed fan out through the bottom of the fan housing.

2. Installing a new fan

Replace the failed fan with an identical 40-mm, 12 volt fan (available from Supermicro: p/n FAN-0085). Push the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans. Reposition the fan housing back over the two mounting posts in the chassis, then reconnect the fan wires to the same chassis fan headers you removed them from. Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.

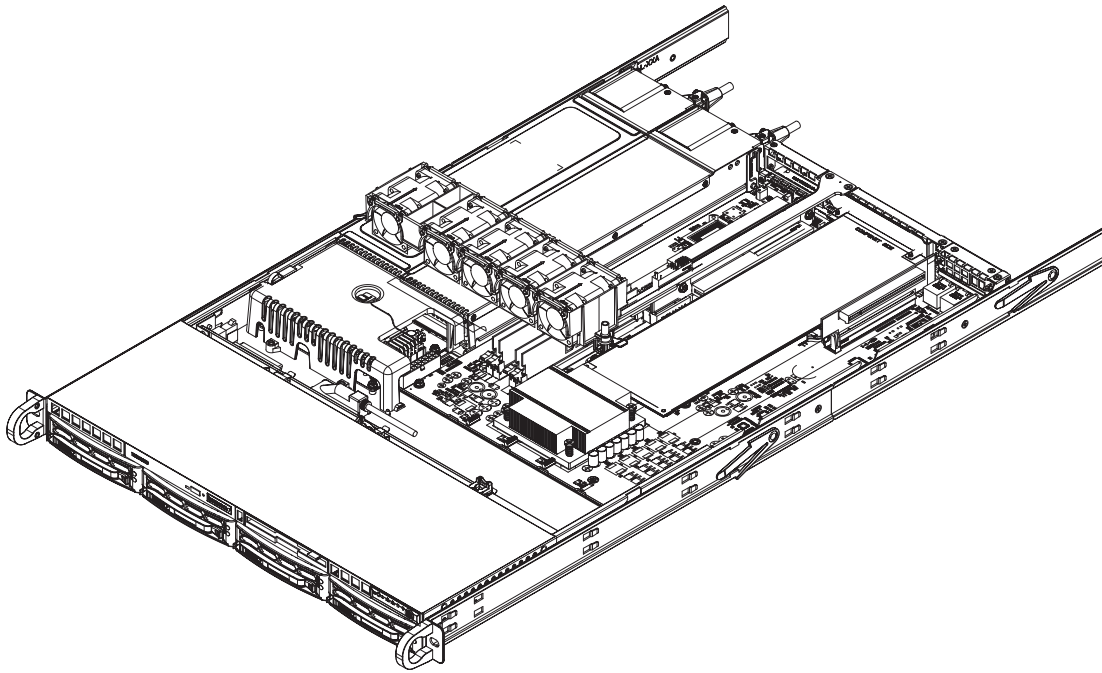


Figure 6-2. Removing the Fan Housing

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

SCSI/SATA Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace SCSI or SATA drives. Proceed to the next step for instructions.

Note: You must use standard 1" high, SCSI/SATA drives in the SuperServer 5015P-8(R)/5015P-T(R).

DVD/CD-ROM/Floppy Disk Drives: For installing/removing a DVD/CD-ROM or floppy disk drive, you will need to gain access to the inside of the system by removing the top cover of the chassis. Proceed to the "DVD/CD-ROM and Floppy Drive Installation" section later in this chapter for instructions.

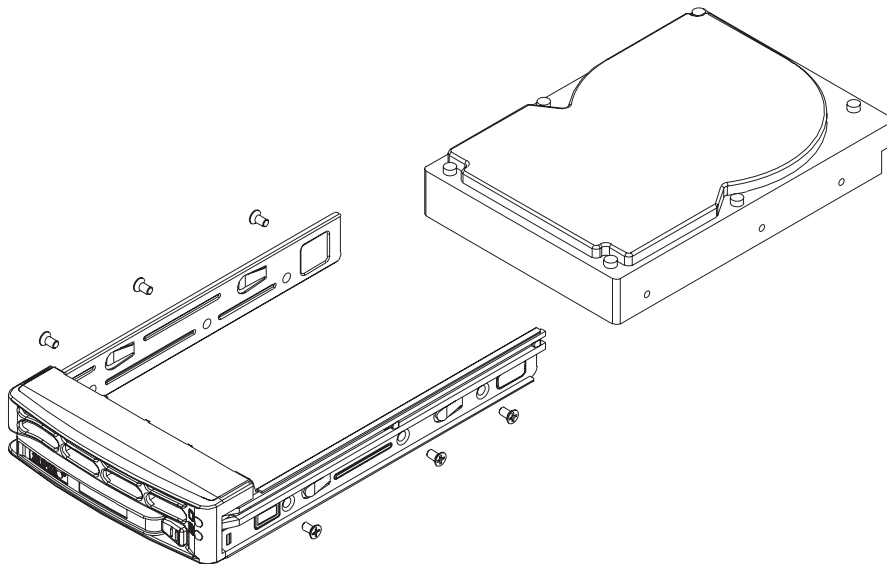
Note: Only "slim" DVD/CD-ROM and floppy drives will fit into the 5015P-8(R)/5015P-T(R).

SCSI/SATA Drive Installation

1. Mounting a SCSI/SATA drive in a drive carrier

The SCSI and SATA drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the Serial ATA drive bays. For this reason, even empty carriers without drives installed must remain in the chassis. To add a new drive, install it into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier. Secure the drive to the carrier with six screws, as shown in Figure 6-3.

Figure 6-3. Mounting a SCSI/SATA Drive in a Carrier



Use caution when working around the SCSI/SATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.



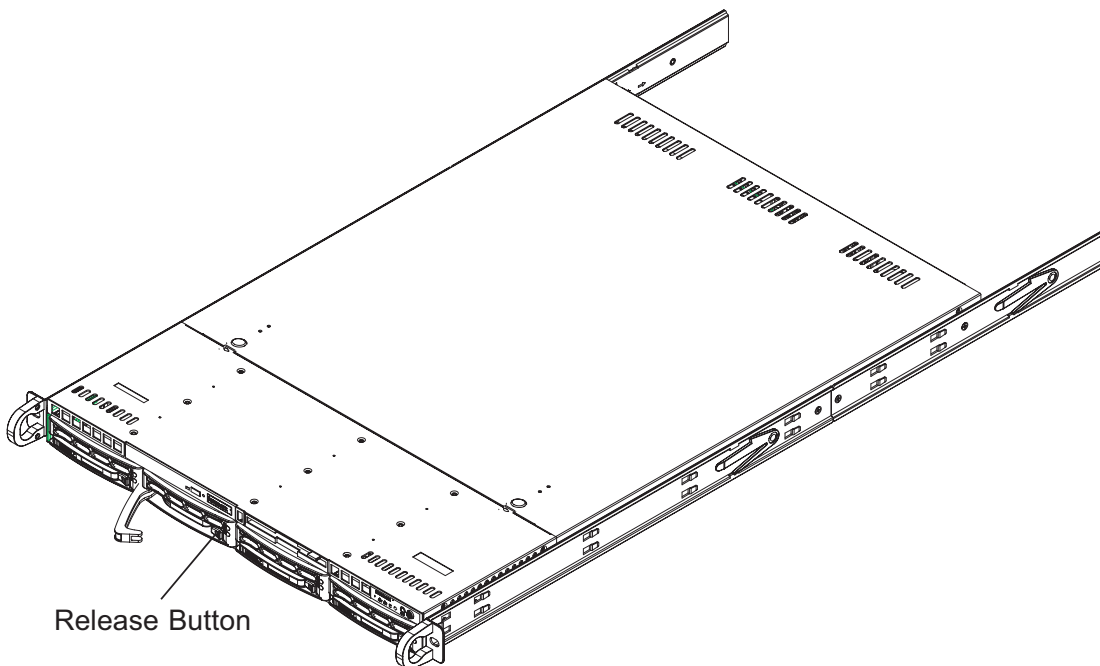
Important: Regardless of how many SCSI/SATA hard drives are installed, all drive carriers must remain in the drive bays for proper airflow.

2. Installing/removing hot-swap SCSI/SATA drives

The SCSI/SATA drive carriers are all easily accessible at the front of the chassis. These hard drives are hot-pluggable, meaning they can be removed and installed without powering down the system. To remove a carrier, push the release button located beside the drive LEDs. Then swing the colored handle fully out and use it to pull the unit straight out (see Figure 6-4).

Note: Your operating system must have RAID support to enable the hot-plug capability of the SCSI/SATA drives.

Figure 6-4. Removing a SCSI/SATA Drive Carrier



Important: All of the SCSI/SATA drive carriers must remain in the drive bays to maintain proper cooling airflow.

SCSI/SATA Backplane

The SCSI/SATA drives plug into a backplane that provides power, drive ID and bus termination. A RAID controller can be used with the backplane to provide data security. The operating system you use must have RAID support to enable the hot-swap capability of the drives. The backplane is already preconfigured, so there are no jumpers or switches present on it.

DVD/CD-ROM and Floppy Drive Installation

The top cover of the chassis must be opened to gain full access to the DVD/CD-ROM and floppy drive bays. The 5015P-8(R)/5015P-T(R) accommodates only slim DVD/CD-ROM and floppy drives. Side mounting brackets are needed to mount the DVD/CD-ROM drive in the server.

You must power down the system before installing or removing a floppy or DVD/CD-ROM drive. First, release the retention screws that secure the server unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

With the chassis cover removed, unplug the power and data cables from the drive you want to remove. Then locate the locking tab at the rear of the drive. It will be on the left side of the drive when viewed from the front of the chassis. Pull the tab away from the drive and push the drive unit out the front of the chassis. Add a new drive by following this procedure in reverse order. You may hear a faint *click* of the locking tab when the drive is fully inserted. Remember to reconnect the data and power cables to the drive before replacing the chassis cover and restoring power to the system. Please be aware of the following:

- The floppy disk drive cable has seven twisted wires.
- A color mark on a cable typically designates the location of pin 1.

6-5 Power Supply

5015P-8R/5015P-TR

The SuperServer 5015P-8R/5015P-TR has a redundant 400 watt power supply configuration consisting of two hot-swappable power modules. The power supply modules have an auto-switching capability, which enables them to automatically sense and operate with a 100V - 240V input voltage.

Power Supply Failure

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The Power On LED on the control panel will turn amber and remain so until the failed module has been replaced. Replacement modules can be ordered directly from Supermicro (see contact information in the Preface). The power supply modules have a hot-swap capability, meaning you can replace the failed module without powering down the system.

Removing/Replacing the Power Supply

You do not need to shut down the system to replace a power supply module. The redundant feature will keep the system up and running while you replace the failed hot-swap module. Replace with the same model - SP400-1R (p/n PWS-0064), which can be ordered directly from Supermicro (see Contact Information in the Preface).

1. Removing the power supply

First unplug the power cord from the failed power supply module. To remove the failed power module, first locate the colored release tab (1). Push the tab to the right (2) and then pull the module straight out with the handle provided (3) (see Figure 6-5, single power supply server shown). The power supply wiring was designed to detach automatically when the module is pulled from the chassis.

2. Installing a new power supply

Replace the failed hot-swap module with another SP400-1R power supply module. Simply push the new power supply module into the power bay until you hear a click. Finish by plugging the AC power cord back into the module.

5015P-8/5015P-T

The SuperServer 5015P-8/5015P-T has a single 400 watt cold-swap power supply, which is auto-switching capable. This enables it to automatically sense and operate with a 100v - 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

Power Supply Failure

If the power supply module fails, the system will shut down and you will need to replace the module. Replacements can be ordered directly from Supermicro (see contact information in the Preface). As there is only one power supply module in the 5015P-8/5015P-T, power must be completely removed from the server before removing and replacing the power supply for whatever reason.

Removing/Replacing the Power Supply

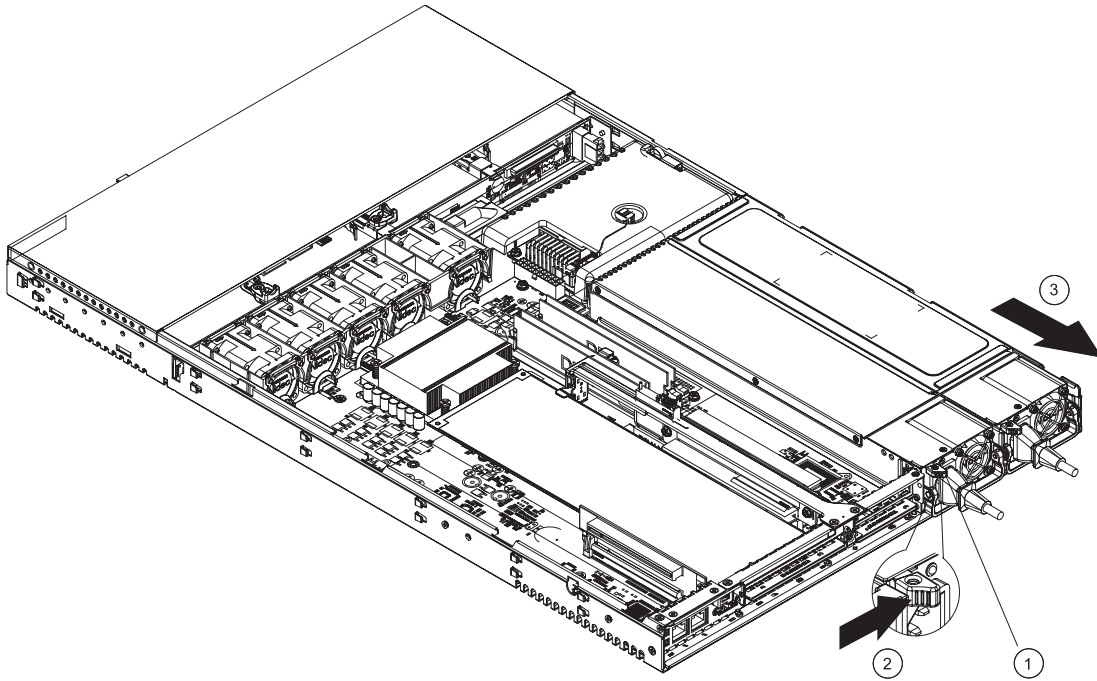
1. Removing the power supply

First turn the power switch on the control panel off, then unplug the power cord from the system. To remove the failed power module, first locate the colored release tab (1). Push the tab to the right (2) and then pull the module straight out with the handle provided (3) (see Figure 6-5). The power supply wiring was designed to detach automatically when the module is pulled from the chassis.

2. Installing a new power supply

Replace the failed power supply with another SP400-1R power supply module (p/n PWS-0064). Carefully insert the new power supply into the open bay and push it completely into the chassis until you hear a clicking sound, meaning it has been fully inserted. Finish by reconnecting the AC power cord and depressing the power button on the chassis front control panel to restart the system.

Figure 6-5. Removing/Replacing the Power Supply



Chapter 7

BIOS

7-1 Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the PDSMP-8/PDSMP-i. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <<http://www.supermicro.com>> for any changes to BIOS that may not be reflected in this manual.

Warning: Do not shut down or reset the system while updating BIOS to prevent possible boot failure.

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The Phoenix BIOS flash chip stores the system parameters, such type of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a backup battery provides power to the BIOS flash chip, enabling it to retain system parameters. Each time the computer is powered-on the computer is configured with the values stored in the BIOS ROM by the system BIOS, which gains control at boot-up.

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot, see below.

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 7-3, detailed descriptions are given for each parameter setting in the Setup utility.

Note: fan speed is controlled by the “Auto Fan Control” setting in BIOS. The recommended setting for the 5015P-8(R)/5015P-T(R) is “3-pin (Server)” (see page 7-17).

7-2 Running Setup

**Default settings are in bold text unless otherwise noted.*

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).

When you first power on the computer, the Phoenix BIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Delete> immediately after turning the system on.
2. When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

Press the <Delete> key to enter Setup

Note: Please load "System Setup Defaults" when using the system the first time.

7-3 Main BIOS Setup

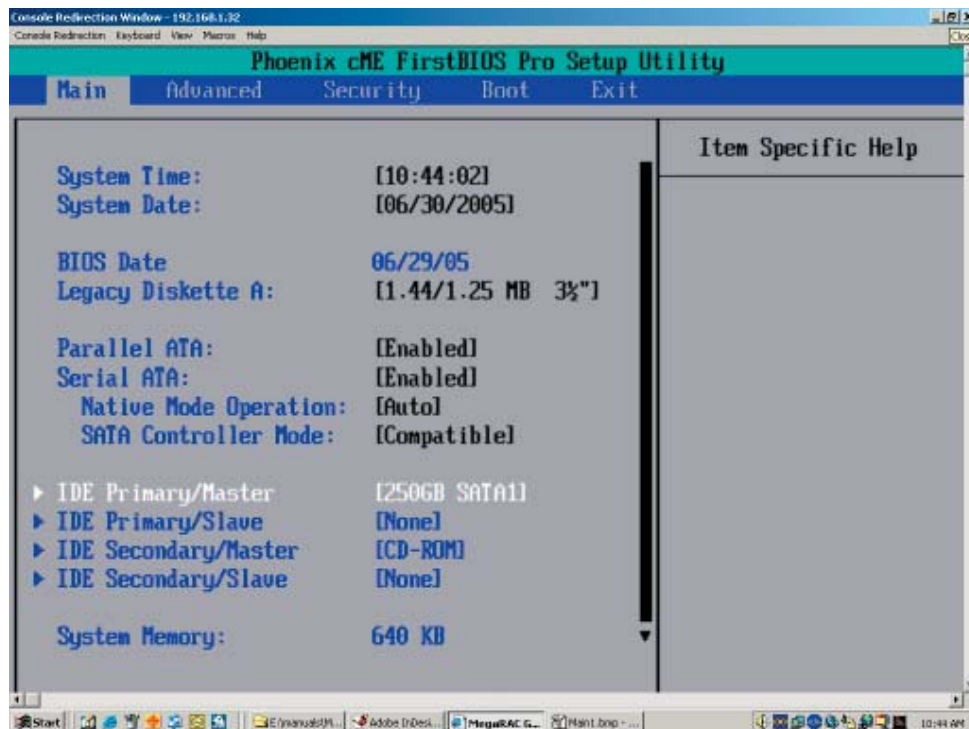
All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ► icon. With the item highlighted, press the <Enter> key to access the submenu.

After entering the submenu, use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting. Press <Tab>, <Shift-Tab>, or <Enter> to select a field.

Main BIOS Setup Menu



Main Setup Features

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields and enter the correct data. Press the <Enter> key to save the data.

BIOS Date

This feature allows BIOS to automatically display the BIOS date.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB, 3.5 in** and 2.88MB 3.5 in.

Parallel ATA

This setting allows the user to enable or disable the Parallel ATA function. The options are Disabled and **Enabled**.

Serial ATA

This setting allows the user to enable or disable the Serial ATA function. The options are Disabled and **Enabled**.

Native Mode Operation

Select the native mode for ATA. The options are: Serial ATA and **Auto**.

SATA Controller Mode

Select **Compatible** to allow the SATA and PATA drives to be auto-detected and placed in the Legacy Mode. Select Enhanced to allow the SATA and PATA drives to be auto-detected and placed in the Native IDE Mode.

Note: The Enhanced mode is supported by the Windows 2000 OS or a later version.

When the SATA Controller Mode is set to "Enhanced", the following items will display:

Serial ATA (SATA) RAID

Select Enable to enable Serial ATA RAID functions. (For a Windows OS environment, use the RAID driver if this feature is set to Enabled. If set to **Disabled**, use the Non-RAID driver. When this feature--SATA RAID is set to Enabled, the next item-"SATA AHCI Enable" will not be available.) The options are Enabled and **Disabled**.

ICH RAID CodeBase

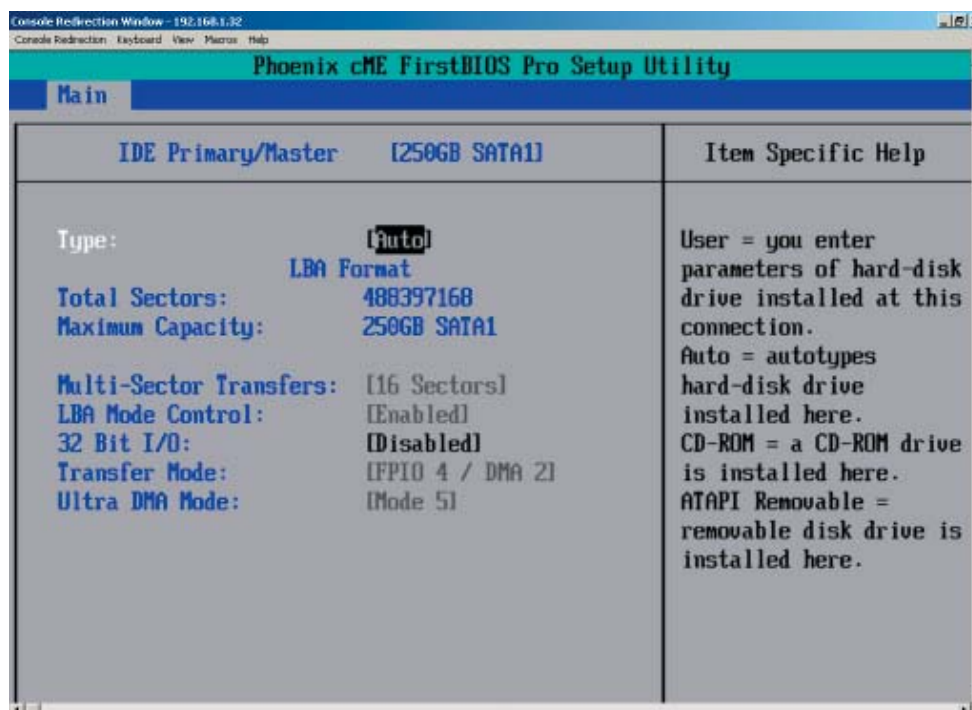
Select Intel to enable Intel's ICH RAID Controller for a Windows OS. Select Adaptec to enable Adaptec's RAID Controller for a Linux OS. The options are **Intel** and Adaptec. (The Adaptec option is available for the PDSMP-i only.)

SATA AHCI

Select Enable to enable the function of Serial ATA Advanced Host Interface. Take caution when using this function, which is for advanced programmers only. The options are Enabled and **Disabled**.

► Primary IDE Master/Slave and Secondary IDE Master/Slave

These settings allow the user to set the parameters of Primary IDE Master/Slave and Secondary IDE Master/Slave slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:



Type

Selects the type of IDE hard drive. The options are **Auto**, (which allows BIOS to automatically determine the hard drive's capacity, number of heads, etc.), a number from 1-39 to select a predetermined type of hard drive, CDROM and ATAPI Removable. The option- "User" will allow the user to enter the parameters of the HDD installed at this connection. The option-"Auto" will allow BIOS to automatically configure the parameters of the HDD installed at the connection. Choose the option 1-39 to select a predetermined HDD type. Select CDROM if a CDROM drive is installed. Select ATAPI if a removable disk drive is installed.

Multi-Sector Transfer

This item allows the user to specify the number of sectors per block to be used in multi-sector transfer. The options are Disabled, 4 Sectors, 8 Sectors and **16 Sectors**.

LBA Mode Control

This item determines if the BIOS will access the Primary IDE Master Device via the LBA mode. The options are Enabled and **Disabled**.

32 Bit I/O

This feature allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and **Disabled**.

Transfer Mode

This feature allows the user to select the transfer mode. The options are **Standard**, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and FPIO4/DMA2.

Ultra DMA Mode

This feature allows the user to select the Ultra DMA Mode. The options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4 and Mode 5.

System Memory

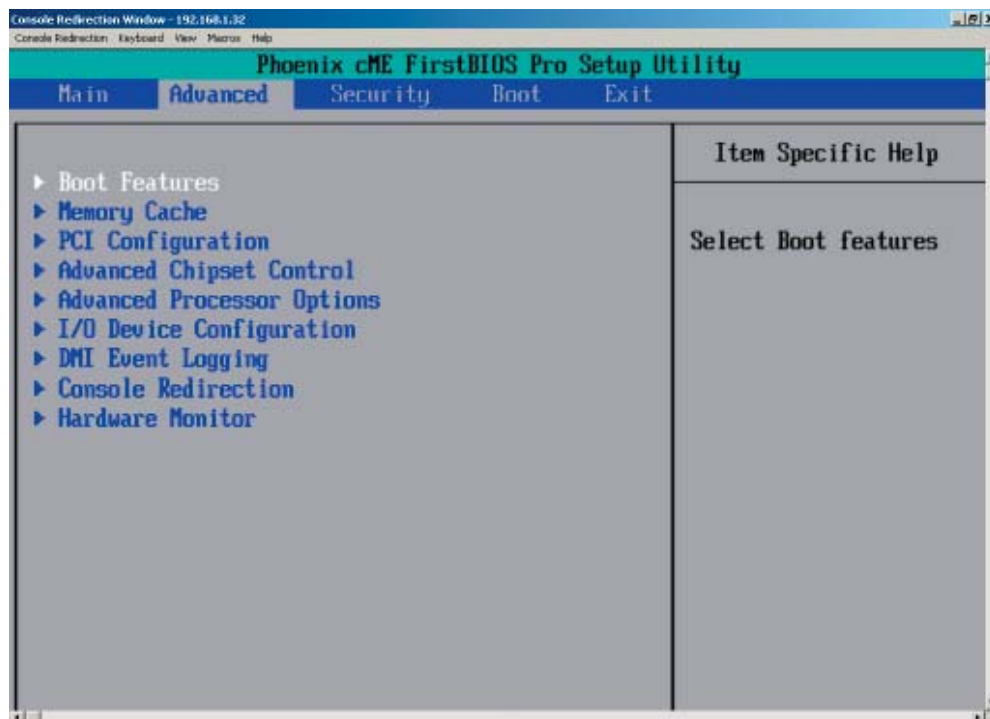
This display informs you how much system memory is detected in the system.

Extended Memory

This display informs you how much extended memory is detected in the system.

7-4 Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <Enter>. All Advanced BIOS Setup options are described in this section.



▶ Boot Features

Access the submenu to make changes to the following settings.

Quick Boot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine by skipping certain tests after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

Quiet Boot

Set to Enabled to display the Diagnostic Screen during POST. The settings are **Enabled** and Disabled.

ACPI Mode

Use the setting to determine if you want to employ ACPI (Advanced Configuration and Power Interface) power management on your system. The options are **Yes** and **No**.

Power Button Behavior

If set to Instant-Off, the system will power off immediately as soon as the user hits the power button. If set to 4-sec., the system will power off when the user presses the power button for 4 seconds or longer. The options are **instant-off** and **4-sec override**.

Resume On Modem Ring

Select On to "wake your system up" when an incoming call is received by your modem. The options are **On** and **Off**.

Power Loss Control

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are **Last State**, **Stay off**, and **Power On**.

Watch Dog

If enabled, this option will automatically reset the system if the system is not active for more than 5 minutes. The options are **Enabled** and **Disabled**.

Summary Screen

This setting allows you to **Enable** or **Disable** the summary screen which displays the system configuration during bootup.

►Memory Cache

Memory Cache

Set to **Enabled** to set the state of Cache Memory. The options are **Enabled** and **Disabled**.

Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS write (cache) its data into this reserved memory area. Select **"Write Protect"** to enable this function, and this area will be reserved for BIOS ROM access only. Select **"Uncached"** to disable this function and make this area available for other devices.

Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS write (cache) its data into this reserved memory area. Select **"Write Protect"** to enable the function and this area will be reserved for Video BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into a buffer, a storage area in the Static DRAM (SDROM) or to be written into L1, L2 cache inside the CPU to speed up CPU operations. Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

Cache Base 512K-640K

If enabled, this feature will allow the data stored in the base memory area: block 512K-640K to be cached (written) into a buffer, a storage area in the Static DRAM (SDROM) or to be written into L1, L2 cache inside the CPU to speed up CPU operations. Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 512K-640K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

Cache Extended Memory

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the L1, L2, L3 cache inside the CPU to speed up CPU operations. Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the extended memory area. Select "Write Back" to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

Discrete MTRR Allocation

If enabled, MTRRs (-Memory Type Range Registers) are configured as distinct, separate units and cannot be overlapped. If enabled, the user can achieve better graphic effects when using a Linux graphic driver that requires the write-combining configuration with 4GB or more memory. The options are **Enabled** and **Disabled**.

►PCI Configuration

Access the submenu to make changes to the following settings for PCI devices.

Onboard GLAN1/GLAN2 (Gigabit- LAN) OPROM Configure

Enabling this option provides the capability to boot from GLAN. The options are **Disabled** and **Enabled**.

Reset Configuration Data

If set to Yes, this setting clears the Extended System Configuration Data- (ESCD) area. The options are **Yes** and **No**.

Frequency for PCIX#1-SCSI/PCIX#2

This option allows the user to change the bus frequency for the devices installed in the slots indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

►Slot 1 PCI-X 100 MHz ZCR/Slot 2 PCI-X 133 MHz/Slot 3 PCI-Exp. x4

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and **Disabled**.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are **Enabled** and **Disabled**.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater Clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novell and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. Different OS requires different Bus Master clock rate.

Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are **DOS** or Other (for Unix, Novelle NetWare and other operating systems).

►Advanced Chipset Control

Access the submenu to make changes to the following settings.



***Warning:** Be careful when changing the Advanced settings. Incorrect values entered may cause system malfunction. Also, a very high DRAM frequency or incorrect DRAM timing may cause system instability. If this occurs, revert to the default setting.

Clock Spectrum Feature

If "Enabled", BIOS will monitor the level of Electromagnetic Interference caused by the components and will attempt to decrease the interference whenever needed. The options are Enabled and **Disabled**.

ECC Conditions

This setting specifies the ECC Error conditions that will be treated as "ECC Error Events" by the system. The options are None, Single Bit, **Multiple Bit** and Both.

Note: This item is available when supported by the memory.

ECC Error Handler

This setting allows you to select the type of interrupt to be activated as a result of an ECC error. The options are None, NMI (Non-Maskable Interrupt), **SMI** (System Management Interrupt) and SCI (System Control Interrupt.)

Note: This item is available when it is supported by the memory.

Route Port 80h Cycles to

This feature allows the user to decide which bus to send the debug information to. The options are PCI and **LPC**.

USB Function

If set to Enabled to enable the USB function when the user keys in a value to a USB item. The options are **Enabled** and Disabled.

Legacy USB Support

This setting allows you to enable support for the Legacy USB devices. The settings are **Enabled** and Disabled.

►Advanced Processor Options

Access the submenu to make changes to the following settings:

CPU Speed

The feature allows the BIOS to display the CPU Speed.

Frequency Ratio (Available when the CPU ratio is not locked.)

This feature allows the user to select the ratio for the internal frequency multiplier of the CPU. The options are **Default**, X14, X15, and X16.

Hyper-threading (*Available when supported by the CPU.)

This setting allows you to **Enable** or Disable the function of hyper-threading. Enabling hyper-threading results in increased CPU performance. (Applicable for XP systems.)

Single Logical Processor Mode (Available when supported by the CPU.)

This feature allows the user to select the Processor Operation Mode. Set to **Disabled** to allow the processor to operate in the "single core" mode. Set to Enabled to allow the processor to operate in the "multi-core" (dual-core) mode.

Machine Checking

Set to Enabled to allow the operating system to debug a system crash after a reset. The options are **Disabled** and Enabled.

L3 Cache (*Available when supported by the CPU.)

Set to **Enabled** to enable L3 cache in the CPU to enhance system performance. The options are Disabled and **Enabled**.

Thermal Management 2 (Available when supported by the CPU.)

If enabled, this feature allows you to select between Thermal Manager 1 and Thermal Manager 2. Set to **Disable** to activate the function of TM1, allowing the CPU to regulate its power consumption based upon the modulation of the CPU Internal clock when the CPU temperature reaches a pre-defined overheat threshold. Set to **Enable** to activate the function of TM2, which will allow the CPU to reduce its power consumption by lowering the CPU frequency and the CPU voltage when the CPU temperature reaches a pre-defined overheat threshold.

Note: please refer to Intel's web site for detailed information.

Adjacent Cache Line Prefetch

The CPU fetches the cache line for 64 bytes if **Disabled**. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

C1 Enhanced Mode (Available when supported by the CPU.)

Set to **Enabled** to enable the Enhanced Halt State. The options are **Enabled** and **Disabled**.

Note: please refer to Intel's web site for detailed information.

No Execute Mode Memory Protection

Enable this feature to enable the functionality of Execute Disable Bit and allow the processor to classify areas in the memory where an application code can execute and where it cannot, and thus preventing a worm or a virus from inserting and creating a flood of codes that will overwhelm the processor or damage the system during an attack. (*Note: this feature is available when your OS and your CPU support the function of Execute Disable Bit.) The options are **Disabled** and **Enabled**.

Note: For more information regarding hardware/software support for this function, please refer to Intel's and Microsoft's web sites.)

Processor Power Management (*Available when supported by the CPU.)

This feature allows the user to determine the processor power management mode. If set to C States only, the processor power will be controlled through CPU power states in the ACPI setting. Select "GV1/GV3 only" to enable the function of DBS (Demand Based Switching) which will allow the user to configure CPU power management in the OS. If set to **Disabled**, C States and GV1/GV3 are disabled. If set to **Enabled**, C States and GV1/GV3 are **Enabled**.

Note: please refer to Intel's web site for detailed information.

► I/O Device Configuration

Access the submenu to make changes to the following settings.

KBC Clock input

This setting allows you to set the clock frequency for the Keyboard Clock. The options are 6MHz, 8MHz, **12 MHz** and 16MHz.

Serial Port A

This setting allows you to decide how Serial Port A is controlled. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

Base I/O Address

Select the base I/O address for Serial Port A. The options are **3F8**, 2F8, 3E8 and 2E8.

Interrupt

Set the Interrupt for Serial Port A. The options are IRQ3 and **IRQ4**.

Serial Port B

This setting allows you to decide how Serial Port B is controlled. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

Mode

This feature allows the user to set the mode for Serial Port B. The options are **Normal** and IR.

Base I/O Address

Select the base I/O address for Serial Port B. The options are 3F8, **2F8**, 3E8 and 2E8.

Interrupt

Set the Interrupt for Serial Port B. The options are **IRQ3** and IRQ4.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled, and Auto (BIOS and OS controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **Primary** and Secondary.

► DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display to inform you of the event log validity. It is not a setting.

Event Log Capacity

This is a display to inform you of the event log capacity. It is not a setting.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting allows you to **Enable** or Disable event logging.

ECC Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and **No**.

► Console Redirection

Access the submenu to make changes to the following settings:

COM Port Address

This item allows you to specify to redirect the console to Onboard COM A or Onboard COM B. This setting can also be **Disabled**.

BAUD Rate

This item allows you to select the BAUD rate for console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K and 115.2K.

Console Type

This item allows you to choose from the available options to select the console type for console redirection. The options are VT100, VT100,8bit, PC-ANSI, 7bit, **PC ANSI**, VT100+, VT-UTF8.

Flow Control

This item allows you to choose from the available options to select the flow control for console redirection. The options are: None, XON/XOFF, and **CTS/RTS**.

Console Connection

This item allows you to decide how Console Redirection is to be connected: either **Direct** or Via Modem.

Continue CR after POST

Choose whether to continue with console redirection after the POST routine. The options are On and **Off**.

► Hardware Monitoring

Access the submenu to make changes to the following settings:

CPU Temperature Threshold

This option allows the user to set a CPU temperature threshold that will activate the alarm system when the CPU temperature reaches this pre-set temperature threshold. The options are 75°C, **80°C**, 85°C and 90°C.

Highlight this and hit <Enter> to see the data for the following items:

Temperature: This item displays the temperature status of the processors and the inside of the system.

Fan Speed

This item displays the speed of each onboard cooling fan:

Fan 1 Speed - FAN 6 Speed: Fan

Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. If the option is set to "3-pin fan", the fan speed is controlled based upon the CPU die temperature. When the CPU die temperature is higher, the fan speed will be higher as well. Select "Disable" to disable the fan speed control function to allow the onboard fans to run at the full speed (12V) at all time. The Options are: Disabled and **3-pin (Server)**.

Voltage: This item displays the voltage status of the following items:

VcoreA

1.5V

VIN0 (3.3)

VIN1 (5V)

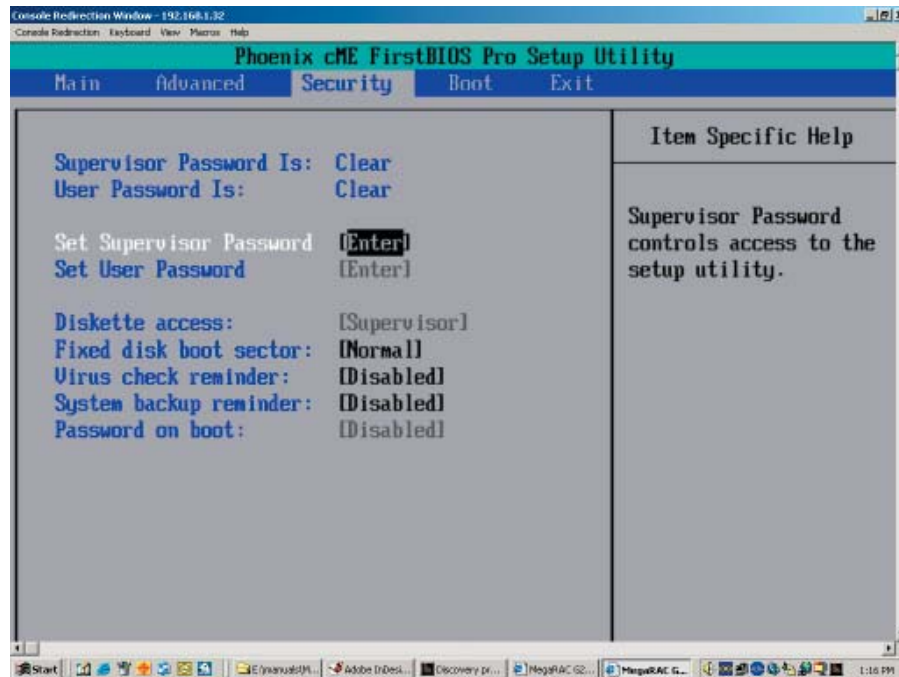
VIN2 (-12V)

VIN3 (12v)

5Vsb (+5V Standby)

7-5 Security

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.



Supervisor Password Is:

This displays whether a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password Is:

This displays whether a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to BIOS.

Set User Password

When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Fixed Disk Boot Sector

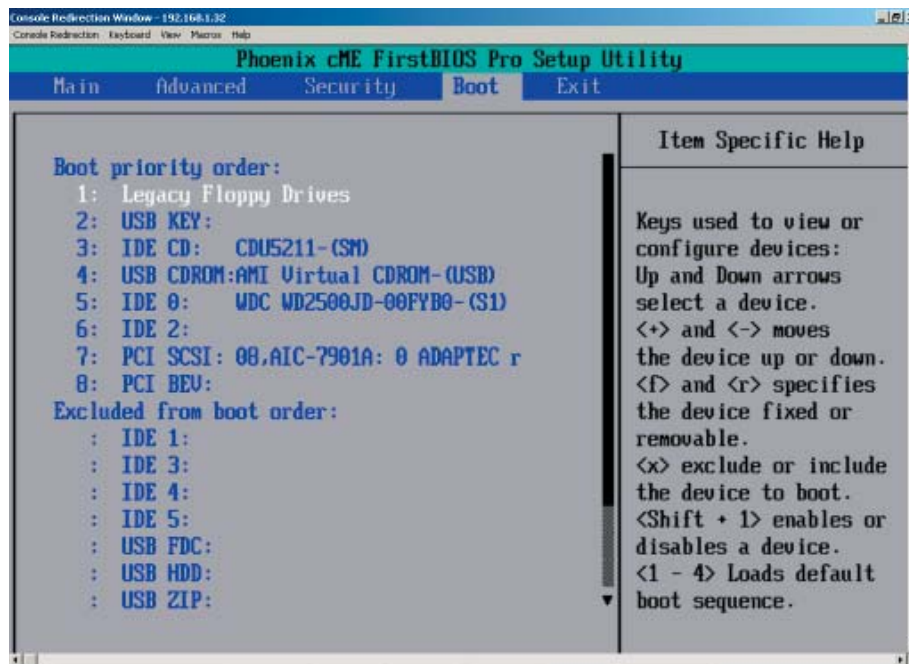
This setting may offer some protection against viruses when set to Write Protect, which protects the boot sector on the hard drive from having a virus written to it. The other option is **Normal**.

Password on Boot

This setting allows you to require a password to be entered when the system boots up. The options are Enabled (password required) and Disabled (password not required).

7-6 Boot

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Highlighting a setting with a + or - will expand or collapse that entry. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

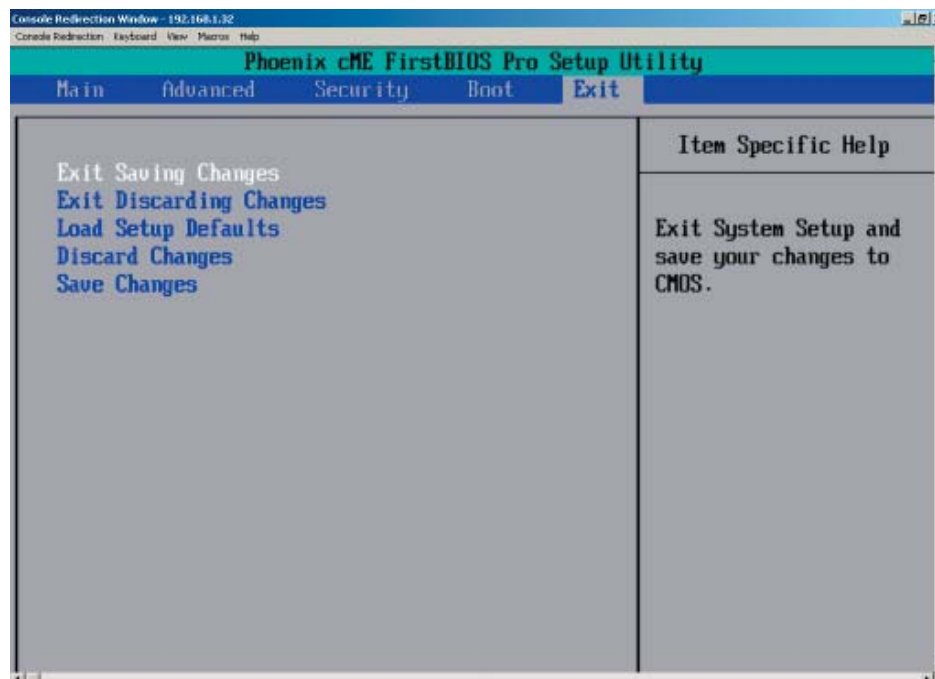


Boot Priority Order/Excluded from Boot Order.

Use the Up and Down Arrow Keys to select a device. Use a <+> key or a <-> key to move the device up or down. Use the <f> key or the <r> key to specify the devices. You can also use the keys indicated above to specify the priority of boot order of a device or to move items from the category of "Excluded from Boot Order" to the category of "Boot Priority Order" and vice versa. See details on how to change the priority of boot order of devices in the "Item Specific Help" window.

7-7 Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.



Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you made. You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain in the Setup utility.

Notes

Appendix A

BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

Beeps	Error Message
1 repetitive long beep	Memory Module Errors
1 long beep + 2 short beeps	VGA Errors

Notes

Appendix B

BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the PhoenixBIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display an POST code that describes the problem. BIOS may also issue one of the following beep codes:

- 1 long and two short beeps - video configuration error
- 1 continuous long beep - overheat (Overheat LED will be on)
- 1 long beep and 1 short pause - memory not detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen.

The following is a list of codes that may be written to port 80h.

POST Code	Description
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Initialize PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size

POST Code	Description
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line xxxx *
2Eh	1-3-4-3 RAM failure on data bits xxxx * of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
47h	Initialize I20 support
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt "Press F2 to enter SETUP"
5Bh	Disable CPU cache

POST Code	Description
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
6Eh	Display possible high address for UMB recovery
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	1-2 Search for option ROMs. One long, two short beeps on check-sum failure

POST Code	Description
99h	Check for SMART Drive (optional)
9Ah	Shadow option ROMs
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase F2 prompt
AAh	Scan for F2 key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST.
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS
B9h	Prepare Boot
BAh	Initialize SMBIOS
BBh	Initialize PnP Option ROMs
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error handler
C5h	PnPnd dual CMOS (optional)
C6h	Initialize note dock (optional)
C7h	Initialize note dock late
C8h	Force check (optional)
C9h	Extended checksum (optional)
CAh	Redirect Int 15h to enable remote keyboard
CBh	Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk
CCh	Redirect Int 10h to enable remote serial video

POST Code	Description
CDh	Re-map I/O and memory for PCMCIA
CEh	Initialize digitizer and display message
D2h	Unknown interrupt

The following are for boot block in Flash ROM

POST Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

Note: If the BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (**xxxx**) indicating the address line or bits that failed. For example, “2C 0002” means address line 1 (bit one set) has failed. “2E 1020” means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the loworder byte of the error. It repeats this sequence continuously.

Notes

Appendix C

Software Installation

After all the hardware has been installed, you must first configure Intel's ICH7R SATA RAID* before you install the Windows Operating System and other software drivers.

If you do not wish to configure onboard SATA RAID functions, please go directly to Section C-4 on page C-16 for Operating System & Other Software Installation.

C-1 Introduction to Serial ATA and Parallel ATA

To configure the SATA RAID functions, you must first use the Intel ICH7R SATA RAID Utility program to configure the RAID Level that you desire before installing the Windows XP/2000/2003 operating system and other software drivers. (The necessary drivers are all included on the Supermicro CD that came packaged with your motherboard.) Note that the current version of the ICH7R SATA RAID Utility can only support Windows XP/2000/2003 Operating Systems.

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface that uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link, which supports transfer rates up to 3Gbps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA are limited to a length of 40cm, while Serial ATA cables can be up to one meter in length. Overall, SATA provides better functionality than PATA.

Introduction to Intel ICH7R Serial RAID

Located in the South Bridge of the E7230 chipset, the I/O Controller Hub (ICH7R) provides the I/O subsystem with access to the rest of the system. It supports a 2-channel UltraATA/100 Bus Master IDE controller (PATA) and four Serial ATA (SATA) ports. The ICH7R supports the following PATA and SATA device configurations: Legacy mode and Native mode.

RAID Configurations

The following types of RAID configurations are supported:

RAID 0 (Data Striping): this writes data in parallel, interleaved ("striped") sections of two hard drives. Data transfer rate is doubled over using a single disk.

RAID1 (Data Mirroring): an identical data image from one drive is copied to another drive. The second drive must be the same size or larger than the first drive.

RAID 10 (Striping & Mirroring): RAID 0 and 1 schemes are combined (without parity information) to get the benefits of both.

RAID 5: both data and parity information are striped and mirrored across three or more hard drives.

Intel Matrix Storage

The Intel Matrix Storage, supported by the ICH7R, allows the user to create RAID 0 and RAID1 set by using only two identical hard disk drives. The Intel Matrix Storage Technology creates two partitions on each hard disk drive and generate a virtual RAID0 and RAID1sets. It also allows you the change the HDD partition size without any data.

Configuring BIOS settings for SATA RAID Functions (Native Mode)

1. Press the key during system bootup to enter the BIOS Setup Utility.

Note: If it is the first time powering on the system, we recommend you load the Optimized Default Settings. If you have already done so, please skip to Step 3.

2. Use the arrow keys to select the "Exit" Settings. Once in the "Exit" settings, Scroll down to select "Load Setup Defaults" and press the <Enter> key. Select "Yes" to confirm the selection. Press the <Enter> key to load the default settings for the BIOS.

3. Use the arrow keys to select the "Main" section in BIOS.

4. Scroll down to "SATA Control Mode" and press the <Enter> key to select "Enhanced"

5. Scroll down to "SATA RAID Enabled" and press <Enter>. Then, select "Enabled."

6. Scroll down to "Exit". Select "Save and Exit" from the "Exit" menu. Press the <Enter> key to save the changes and exit the BIOS.

7. Once you've exited the BIOS Utility, the system will re-boot.

8. During the system boot-up, press the <Ctrl> and <I> keys simultaneously to run the Intel RAID Configuration Utility when prompted by the following message: *Press <Ctrl> <I> for Intel RAID Configuration Utility.*

Using the Intel ICH7R SATA RAID Utility Program

1. Creating, Deleting and Resetting RAID Volumes:

- a. After the system exits from the BIOS Setup Utility, the system will automatically reboot. The following screen appears after Power-On Self Test.

```

RAID Volumes:
None defined.

Physical Disks:
Port Drive Model      Serial #              Size   Type/Status(Vol ID)
0    WDC WD2500SD-01K  WD-WMAL72034971      232.9GB Non-RAID Disk
1    WDC WD2500SD-01K  WD-WMAL72034599      232.9GB Non-RAID Disk
2    WDC WD2500JD-00F  WD-WMAEH1376109      232.9GB Non-RAID Disk
3    WDC WD2500JD-00F  WD-WMAEH1449527      232.9GB Non-RAID Disk

Press <CTRL-I> to enter Configuration Utility...

Adaptec SCSI BIOS v4.30.0
Copyright 2003 Adaptec, Inc. All Rights Reserved.

<<< Press <Ctrl><A> for SCSISelect(TM) Utility! >>>

Slot Ch ID LUN  Vendor      Product              Size  Bus Status
-----
04  A  10  0

```

- b. When you see the above screen, press the <Ctrl> and the <I> keys simultaneously to have the main menu of the SATA RAID Utility appear:

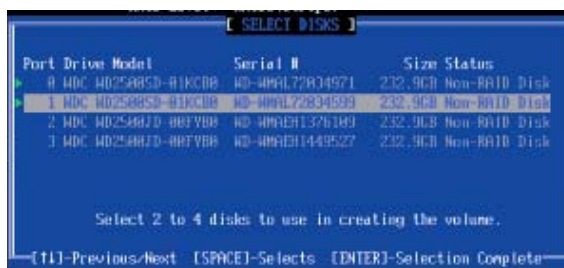
Note: All graphics and screen shots shown in the manual are for reference only. The screen shots shown in the manual do not imply Supernicro's endorsement or non-endorsement on any 3rd party's product. Your screens may or many not look exactly the same as the graphics shown in this manual.

Creating a RAID 0 Volume:

- a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:



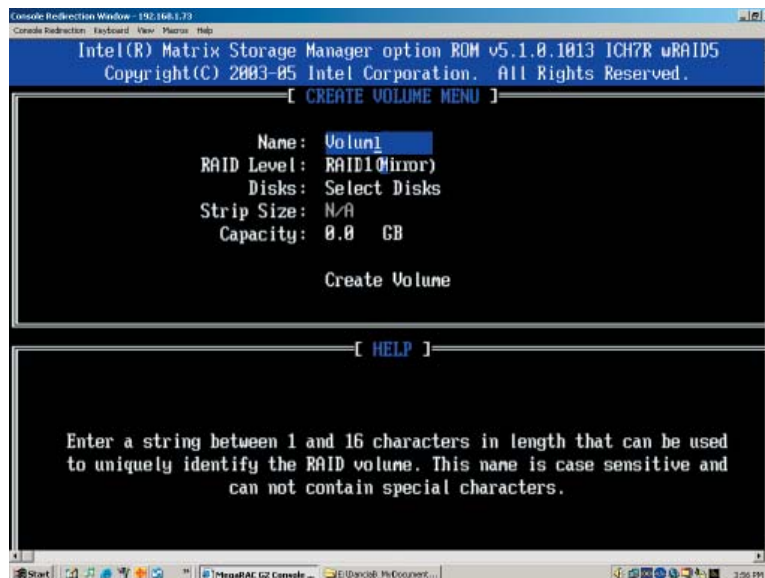
- b. Specify a name for the **RAID 0** set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)
- c. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select **RAID 0 (Stripe)** and hit <Enter>.
- d. When the Disks item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen (*See Note on Page C-3) displays:



- e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.
- f. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranged from 4 KB to 128 KB for the RAID 0 array, and hit <Enter>. (*Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.)
- g. Press <Enter> when the Create Volume item is highlighted. A warning message displays.
- h. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 1 Volume:

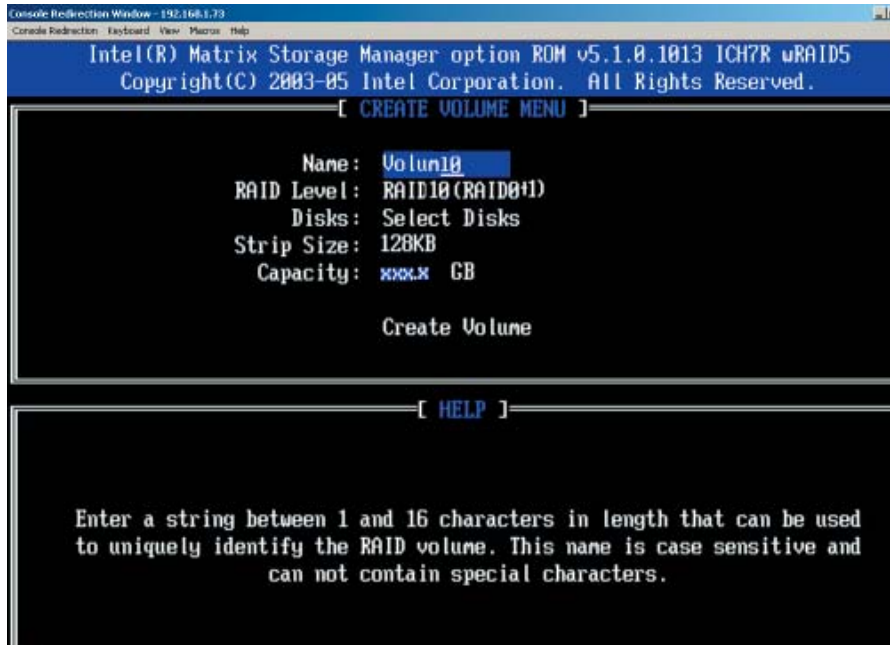
- a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:



- b. Specify a name for the **RAID 1** set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)
- c. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select **RAID 1 (Mirror)** and hit <Enter>.
- d. When the Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.
- e. Press <Enter> when the Create Volume item is highlighted. A warning message displays.
- f. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 10 (RAID 1+ RAID 0):

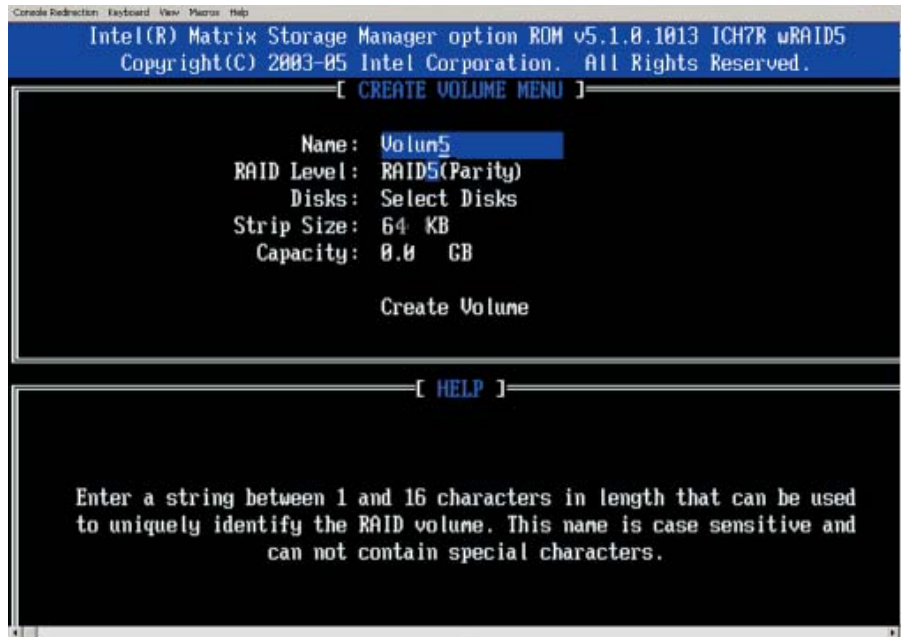
- a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:



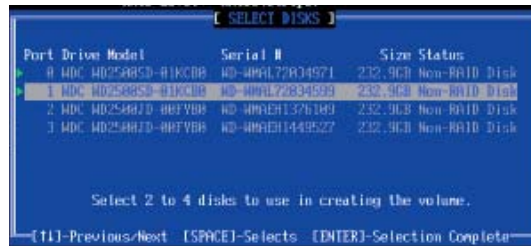
- b. Specify a name for the **RAID 10** set and press <Enter>.
- c. When RAID Level item is highlighted, use the <Up Arrow>, <Down Arrow> keys to select **RAID 10 (RAID1 + RAID0)** and hit <Enter>.
- d. When the Stripe Size is highlighted, use the <Up Arrow>, <Down Arrow> keys to select the stripe size from 4 KB to 128 KB for your RAID 10 and hit <Enter>. The default setting is 6 4KB. (*Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size.)
- e. When the RAID Volume Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.
- f. Press <Enter> when the Create Volume item is highlighted. A warning message displays.
- f. When asked "Are you sure you want to create this volume (Y/N)", press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 5 Set (Parity):

a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:



- b. Specify a name for the **RAID 5** set and press <Enter>.
- c. When the Raid Level is highlighted, use the <Up Arrow>, <Down Arrow> keys to select **RAID 5 (Parity)** and hit <Enter>.
- d. When the Disk item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen (*See Note on Page C-3) displays:



- e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.
- f. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranged from 4 KB to 128 KB for the RAID 5 array, and hit <Enter>. (*Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.)
- g. Enter your desired RAID volume capacity and press <Enter> when the capacity item is highlighted. The default setting is the maximum capacity allowed.
- h. Press Enter when the Create Volume item is highlighted. A warning message displays.
- h. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Deleting RAID Volume:



(Warning: Be sure to back up your data before deleting a RAID set. You will lose all data on the disk drives when deleting a RAID set.)

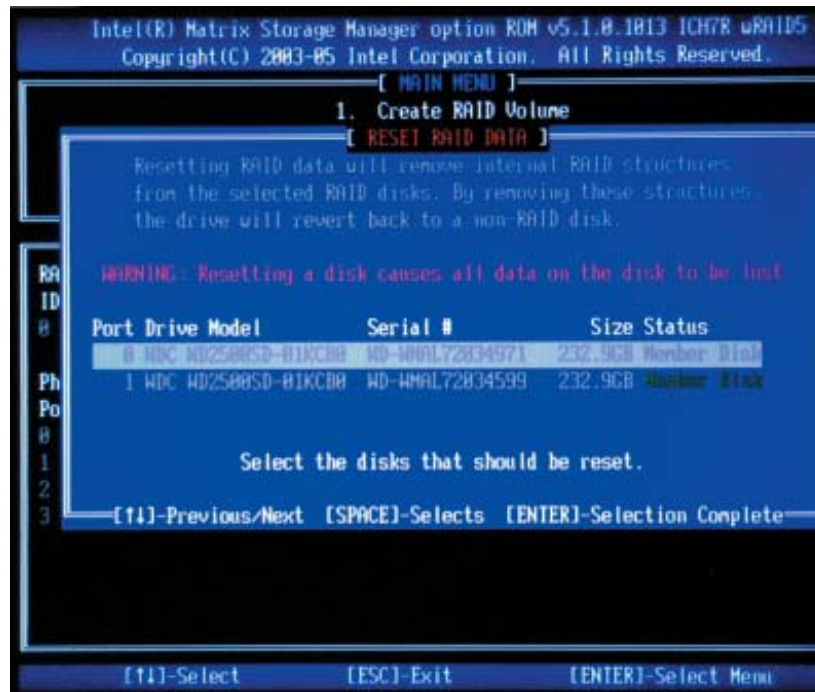
- a. From the main menu, select item2-Delete RAID Volume, and press <Enter>.
- b. Use the <Up Arrow>, <Down Arrow> keys to select the RAID set you want to delete and press . A Warning message displays.
- c. When asked "Are you sure you want to delete this volume (Y/N)", press "Y" to delete the RAID volume, or type "N" to go back to the Delete Volume menu.

Resetting to Non-RAID and Resetting a RAID HDD



(**Warning:** Be cautious when you reset a RAID volume HDD to non-RAID or Resetting a RAID HDD. Resetting a RAID volume HDD or Restting a RAID HDD will reformat the HDD and delete all internal RAID structure on the drive.)

- a. From the main menu, select item3-Reset Disks to Non- RAID, and press <Enter>. The following screen will appear:



- b. Use the <Up Arrow>, <Down Arrow> keys to highlight the RAID set drive to reset and press <Space> to select.
- c. Press <Enter> to reset the RAID set drive. A Warning message displays.
- d. Press "Y" to reset the drive, or type "N" to go back to the main menu.

Exiting the Intel Matrix Storage Manager Utility:

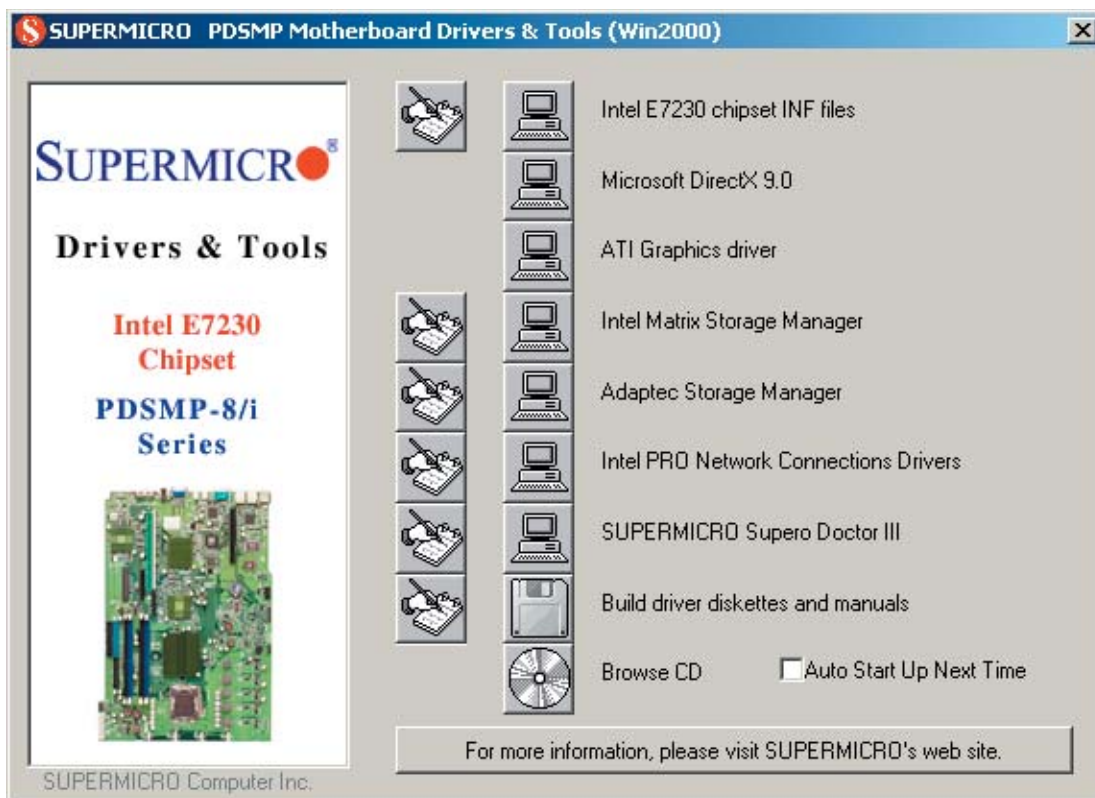
- a. From the main menu, select item4-Exit, and press <Enter>. A warning message will appear.
- b. Press "Y" to reset the drive, or type "N" to go back to the main menu.

C-2 Installing the Windows XP/2000/2003 for systems with RAID Functions

New Operating System-Windows XP/2000/2003 Installation

- a. Insert Microsoft Windows XP/2000/2003 Setup CD in the CD Driver, and the system will start booting up from CD.
- b. Press the <F6> key when the message-" Press F6 if you need to install a third party SCSI or RAID driver" displays.
- c. When the Windows XP/2000/2003 Setup screen appears, press "S" to specify additional device(s).
- d. Insert the driver diskette-"Intel AA RAID XP/2000/2003 Driver for ICH7R into Drive A: and press the <Enter> key.
- e. Choose Intel(R)82801GR/GH *SATA RAID Controller* from the list indicated in the XP/2000/2003 Setup Screen, and press the <Enter> key.
- f. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.
- g. From the Windows XP/2000/2003 Setup screen, press the <Enter> key. The XP/2000/2003 Setup will automatically load all device files and then, continue the Windows XP/2000/2003 installation.
- h. After Windows XP/2000/2003 Installation is completed, the system will automatically reboot.
- i. Insert Supermicro CD that came with the package into the CD Drive during system reboot, and the following screen will appear:

Note: the current version of the ICH7R SATA RAID Utility can only support Windows XP/2000/2003 Operating System.



Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility and the LAN/SCSI driver diskettes, which are optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.

C-3 Installing Intel Application Accelerator Utility

- a. When the above screen appears, click on the icon marked "Application Accelerator RAID Edition" on the screen, and the following screen will appear:

Intel ICH5R Serial ATA RAID Introduction

The **InstallShield Wizard** will begin automatically for installation showed as following:



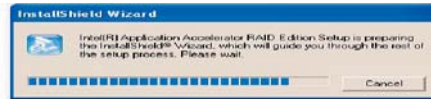
Click on the **Next** button to proceed the installation in the welcoming window.



14

Intel ICH5R Serial ATA RAID Introduction

The **InstallShield Wizard** will begin automatically for installation showed as following:



Click on the **Next** button to proceed the installation in the welcoming window.

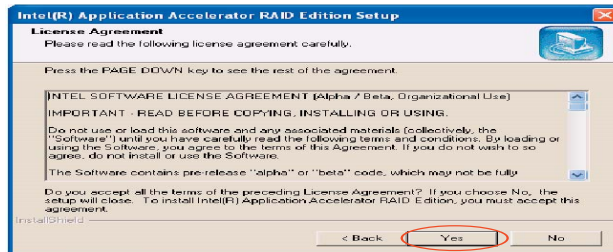


15

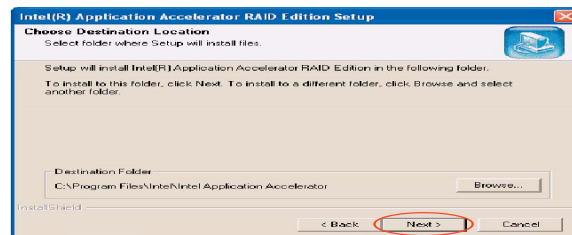
- b. When the above screen appears, click on the icon marked "Next" on the screen, and the following screen will appear:

Intel ICH5R Serial ATA RAID Introduction

After reading the license agreement in the following window, click **Yes** button to continue.



Select the folder in which you want the program to be installed in the following window, and click **Next** button to start installation.

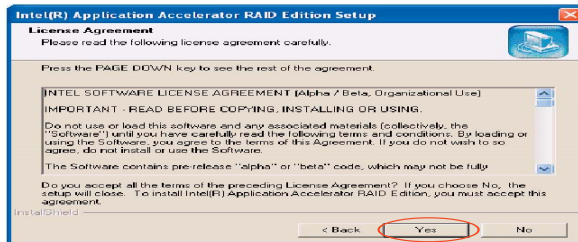


16

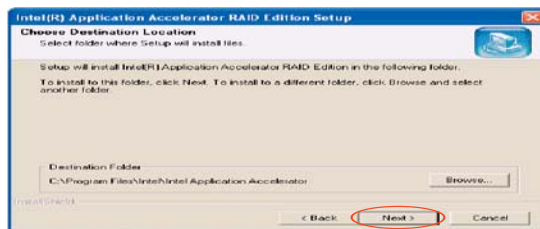
- c. After reading the License Agreement, click on the icon marked "Yes" on the screen, and the following screen will appear:
- d. Specify the folder that you want the program to be installed in and then, click on the icon marked "Next" to begin the installation process.

Intel ICH5R Serial ATA RAID Introduction

After reading the license agreement in the following window, click **Yes** button to continue.



Select the folder in which you want the program to be installed in the following window, and click **Next** button to start installation.



16

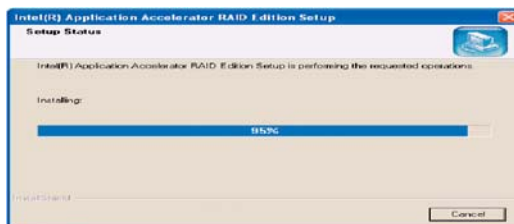
- e. Specify a program folder where you want the Setup to add the program icon as shown in the following screen and click on the icon marked "Next".

Intel ICH5R Serial ATA RAID Introduction

Select a program folder in the following window where you want Setup to add the program icon.



The following window appears to show the Intel Application Accelerator RAID Edition Setup installation status.

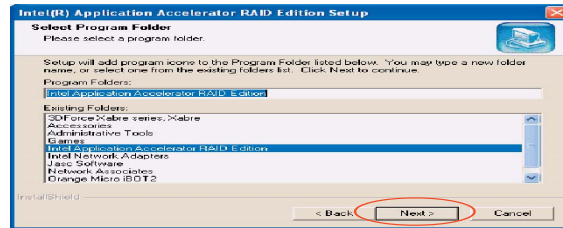


17

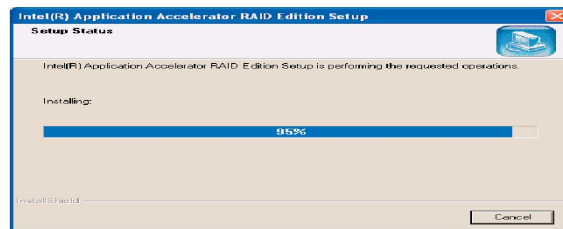
f. The following screen will appear to display the status of the Intel Application Accelerator RAID Edition Installation.

Intel ICH5R Serial ATA RAID Introduction

Select a program folder in the following window where you want Setup to add the program icon.



The following window appears to show the Intel Application Accelerator RAID Edition Setup installation status.

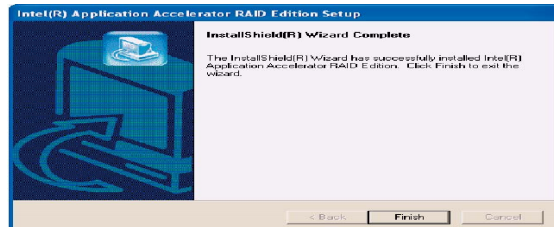


17

g. Once the Application Accelerator RAID Edition installation is completed, the following screen will appear and the system will start to re-boot.

Intel ICH5R Serial ATA RAID Introduction

Once the installation is complete, the following window appears.

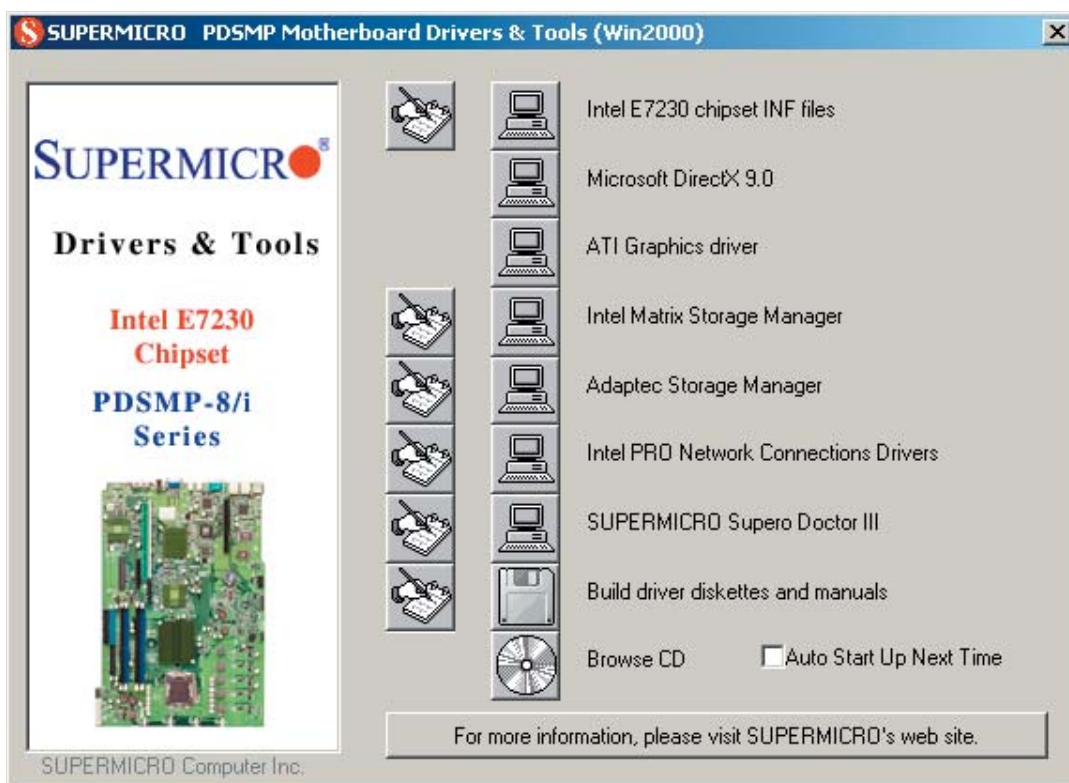


18

Note: Once the XP/2000/2003 Operating System is installed, please read the "Readme text files" for the instructions to use the SATA RAID Utility in the Windows XP/2000/2003 OS environment.

C-4 Installing the Operating System and other Software Programs

After all the hardware has been installed, you must first install the operating system, and then, other software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard. (Note: for the Windows 2003 OS, please refer to Page C-14.)



Driver/Tool Installation Display Screen

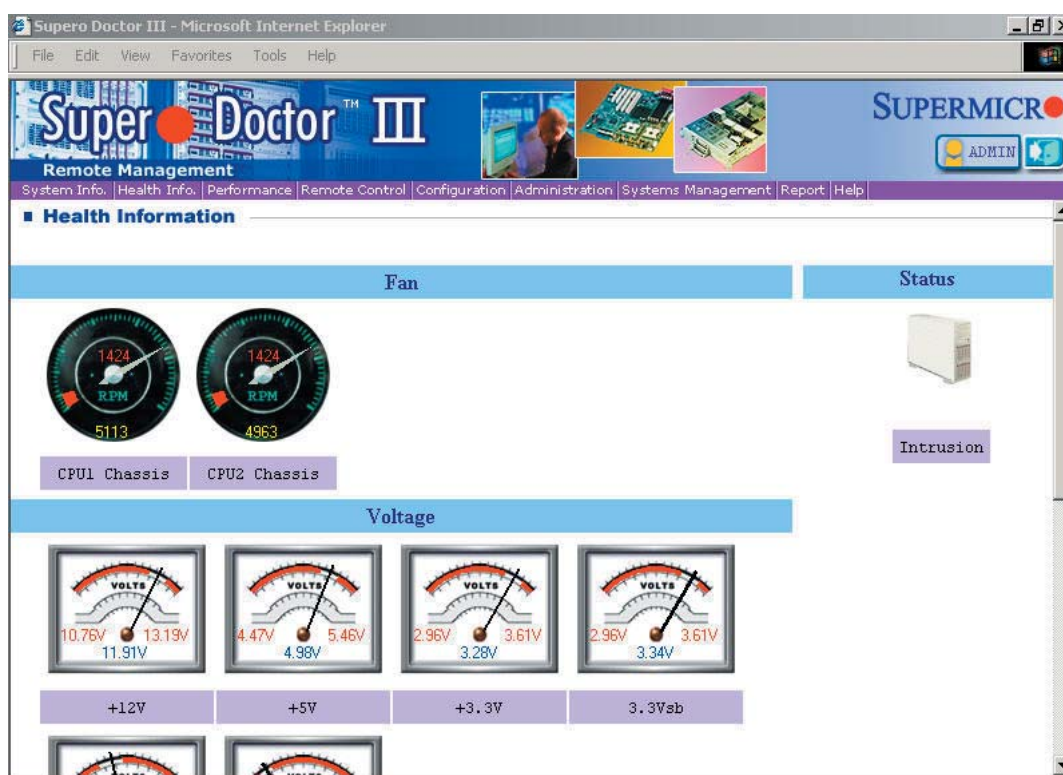
Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility and the LAN/SCSI driver diskettes, which are optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Supero Doctor III

The Supero Doctor III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

Supero Doctor III Interface Display Screen-I (Health Information)



Supero Doctor III Interface Display Screen-II (Remote Control)



Note: SD III Software Revision 1.0 can be downloaded from our Website at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: <http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf>. For Linux, we will still recommend Supero Doctor II.

Notes

Appendix D

System Specifications

Processors

Single Intel Pentium® D, Pentium 4 Extreme, Pentium 4 or Celeron® D type processors.

Note: Please refer to our web site for a complete listing of supported processors.

Chipset

Intel E7230 chipset

BIOS

8 Mb Phoenix® Flash ROM

Memory Capacity

Four 240-pin DIMM sockets supporting up to 8 GB of unbuffered ECC/non-ECC DDR2-667/533/400 SDRAM

Note: See the memory section in Chapter 5 for details.

SCSI Controller [5015P-8(R)]

AIC-7902 for dual channel Ultra320 SCSI

Serial ATA Controller [5015P-T(R)]

Intel ICH7R on-chip controller for 4-port Serial ATA (supports RAID 0, 1, 5 and 10)

Drive Bays

5015P-8(R): Four (4) hot-swap drive bays to house four (4) standard SCSI drives

5015P-T(R): Four (4) hot-swap drive bays to house four (4) standard Serial ATA drives

Peripheral Drives/Bays

One (1) slim floppy drive

One (1) slim DVD/CD-ROM drive

Expansion Slots

Supports the use of one standard size 133 MHz PCI-X or PCI-Express x4 add-on card and one low profile 100 MHz PCI-X add-on card (See Section 5-6 for details)

Serverboard [5015P-8(R)/5015P-T(R)]

Model: PDSMP-8/PDSMP-i (proprietary form factor)

Dimensions: 11.2" x 16.2" (285 x 412 mm)

Chassis

5015P-8(R): SC816S-400 (1U rackmount)

5015P-T(R): SC816T-400 (1U rackmount)

Dimensions (both): (HxWxD) 1.7 x 17.2 x 27 in. (43 x 437 x 686 mm)

Weight

5015P-8/T Gross (Bare Bone): 57 lbs. (25.9 kg.)

5015P-8R/TR Gross (Bare Bone): 60 lbs. (27.3 kg.)

System Cooling

Three (3) paired sets of 40-mm counter-rotating cooling fans (fan speed controlled by BIOS setting)

System Input Requirements

AC Input Voltage: 100-240 VAC

Rated Input Current: 10A (115V) to 5A (230V)

Rated Input Frequency: 50-60 Hz

Power Supply

Rated Output Power: 500W (Model# SP502-1S, Part# PWS-0048)

Rated Output Voltages: +3.3V (21A), +5V (30A), +12V_{ALL} (39A), +5Vsb (2A)

BTU Rating

2750 BTUs/hr (for rated output power pof 500 W)

Operating Environment

Operating Temperature: 10° to 35° C (50° to 95° F)

Non-Operating Temperature: -40° to 70° C (-40° to 158° F)

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-Operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions:

FCC Class B, EN 55022 Class B, EN 61000-3-2/-3-3, CISPR 22 Class B

Electromagnetic Immunity:

EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4,
EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:

EN 60950/IEC 60950-Compliant

UL Listed (USA)

CUL Listed (Canada)

TUV Certified (Germany)

CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:

This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

Notes